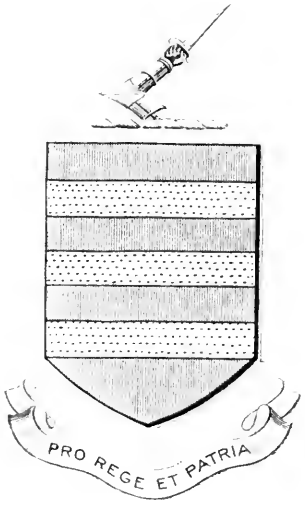
SURGICAL CONTRIBUTIONS

GENERAL SURGERY

RUTHERFORD MORISON



SURGICAL CONTRIBUTIONS.

Frontispiece

PHOTOGRAPH OF MR. RUTHERFORD MORISON AND HIS LATE HOUSE SURGEONS.
A reduced copy of the original which formed part of a presentation.

SURGICAL CONTRIBUTIONS

FROM 1881-1916.

BY

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Volume I.

GENERAL SURGERY.

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DEDICATED

TO

MY LATE HOUSE SURGEONS.

PREFACE.

I WAS greatly pleased when Mr. Rutherford Morison told me that he had decided to accede to a request made to him by distinguished surgical friends that he should publish a collection of his scattered papers on surgical subjects. Though acquainted with a large number of these papers, I was, as I believe he was himself, surprised that they amounted to so many, for he had not been by any means a voluminous writer. Now that these papers are brought together, the wisdom of his friends is evident, for the collection makes accessible a mine of information and surgical acumen which will, I have little doubt, be hailed with satisfaction by the surgical world, and will also be appreciated as a book of ready reference by physicians, who are often the first to be consulted on account of some illness in which abdominal symptoms are prominent.

The reader should bear in mind that these articles are not a selection, but are practically all that was written in the form of papers and communications to societies. The writer records not only his successes, but also many of his failures, which, with characteristic generosity, he has related for the guidance of others. Moreover, they illustrate the teaching of an apostle of the antiseptic treatment, who had studied under the immortal Lister when he was evolving his theories which were to revolutionize surgery, and to have such far-reaching effect upon the comprehension of the nature of diseases that come within the sphere of the physician, and upon the methods of dealing with them.

For the "piping times of peace" aseptic surgery has proved sufficient for most purposes, but the conditions of war have brought us back to sterner methods in Surgery, as in many other things, and we now see that if the best chance of recovery from wounds is to be given

to our soldiers, a return to the principles of Lister, with, perhaps, some improved methods, will have to be encouraged; and it is advisable that the principles should be thoroughly studied by those who have not as yet fully comprehended them. These papers give an insight to the original conception of the antiseptic methods which it is hoped will prove useful and suggestive at the present time.

It will be a little difficult for younger surgeons to remember that these papers record work done when they were—if they were at all—clothed in long robes, or wearing cock-tail petticoats, and that now, perched on the author's shoulder, it would be childish to crow, "I am taller than Daddy." These volumes will probably throw more light upon the morning of modern surgery than almost any book that can be referred to, and so will have an historic interest when the truths they teach will have become—as, indeed, many of them have long since been—accepted axioms.

It is, perhaps, hardly necessary to apologize for occasional repetition. This could only have been avoided by elaborate editing, and would have taken away the simplicity of the book. When it is remembered that the papers were written for different societies and journals, with different circulations, repetition was bound to occur; moreover, repetition is an absolute necessity if a truth is to be driven home. In this year, when we have the benefit of the Daylight Saving Act given to us, how many must feel humiliated to think that it required a European War and the example of other nations to get this idea into the heads of men who even had a reputation for being clever. Well, then, may the Surgeon with original ideas be excused for repeating over and over again the reasons for his belief.

To have published these papers without an Index would have been a grievous fault, and so a pretty full one, for which I am responsible, has been added, constructed, as far as possible, to make available to the busy practitioner, the researching surgeon, and even the physician in doubt, information which bears upon the case in hand.

There has also been added a list of names of those who have been mentioned in connection with surgical work, or attendance on cases—a long list—for Mr. Rutherford Morison has been generous in acknowledging the services of others, and the sources from which he himself derived information; and to those of us who know his fondness for surgical literature, it is not surprising to find the names of the leading surgeons of our Colonies, of America, and of Europe.

W. D'Oyly Grange.

Harrogate, 1916.

LIST OF PRINCIPAL PAPERS.

LIST OF PLATES.

LIST OF PLATES

The comments in italics appearing throughout as footnotes are intended to express my views up to the present date.

R. M.

1916.

RUTHERFORD MORISON'S SURGICAL CONTRIBUTIONS.

Volume I.
GENERAL SURGERY.

1881

ANTISEPTIC DRESSINGS.

(*Birmingham Medical Review*, 1881, iv, p. 354.)

THE following paper, which was read before the South Durham and Cleveland Medical Society, will, I hope, be of some interest in connection with the recent papers of Mr. Gamgee on wound treatment. I have added a case lately treated, showing the advantages of the catgut suture and drain, as suggested in the paper, and as an additional example of what may be achieved by this method.

In 1877, Dr. Marion Sims wrote in the *British Medical Journal*, suggesting the use of cotton-wool as an antiseptic dressing, and expressed astonishment that Mr. Lister, who had found it so useful as a filter for atmospheric germs, should not have thought it worthy of a trial for surgical purposes, apparently overlooking the fact that Mr. Lister had got rid of any germs which might have been residing in or on the wool by heat or chemical agencies before using it for filtration purposes.

After seeing this paper, I determined, when opportunity offered, to try cotton-wool as a dressing, and to use it in place of the gauze of Professor Lister. It was evident that the dry surface of cotton-wool, which had been exposed to the air, must serve as a resting place for germs, as it contained no germicide, and the wool serves only, as Mr. Lister has shown, as a mechanical antiseptic; germs being unable to get through complicated passages. It was necessary, then, first to destroy any source of putrefaction on the surface of the wool, or at least to have an active antiseptic between it and the surface of the wound.

For this purpose I used an ointment of boracic acid (pulv. acid. boracic. ʒj, adeps ℥j), and feeling satisfied with the result, have tried it in a number of cases where some exigency of private practice prevented the use of the ordinary gauze dressing.

My plan of proceeding is as follows :—

The parts to be operated on having been well washed, as in Mr. Lister's method, with a strong solution of carbolic acid (5 per cent), knives, sponges, fingers, instruments, and everything to come in contact with the wound, being carefully disinfected, and a spray kept playing during the whole time of exposure—ligatures, drainage tubes, sutures, and other necessaries attended to, and the wound ready for dressing, with the spray still playing over it—a piece of cotton-wool spread with a layer half an inch thick of boracic ointment, and sufficient surface of ointment to reach two or three inches round the edges of the wound is laid over it, and on this, layers of cotton-wool, in quantity proportioned to the expected amount of discharge.

This may be left untouched from three or four days to as many weeks, if pain, constitutional disturbance, or the external appearance of discharge, do not indicate its removal.

The first case in which I had an opportunity of testing the dressing was one of purulent synovitis of the knee, in a delicate puerperal woman, on November 8th, 1877.

The knee-joint had been tapped three weeks before, and a semi-purulent fluid withdrawn, but a further accumulation had taken place, which the severe constitutional disturbance and character of the previously removed fluid almost proved to be purulent. The temperature on the evening before the operation was 103°, emaciation, complete loss of appetite, and severe pain in the knee, preventing sleep, being the chief symptoms. The knee-joint was freely opened on both sides with the previously-mentioned antiseptic precautions, some ounces of pus squeezed out, and a large-sized drainage tube passed into each opening.

The boracic ointment and cotton-wool dressing was applied, a continuous extension apparatus used to steady the leg, and the dressing left for four days, when the temperature was normal, and all pain had disappeared.*

As it was then impossible to estimate what amount of discharge might have escaped into the dressing, it was removed, and found to be blood-stained, with a trace of pus, but odourless. The same dressing was reapplied, and in a month more the wounds were healed,

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**My first experience of continuous extension in the treatment of acute joint disease occurred in Edinburgh Infirmary when I was House Surgeon to Dr. Patrick Heron Watson in* 1875. *He had forcibly straightened, under an anæsthetic, the flexed ankylosed knee-joint of a middle-aged man, and placed the straightened limb in an anterior splint. In spite of the free use of morphia the patient was in such agony that he kept the whole ward disturbed. I dare not remove the*

the discharge always remaining small in quantity, and, after the first dressing, free from pus. Movement was moderately free in the joint, and the patient got out of bed, when unfortunately a chronic œdema of the leg, probably puerperal, set in and still persists, without detriment to her general health, but preventing her from getting about without a crutch.

I have since used the same dressing in amputations, strangulated hernia, excision of tumours, and have been well satisfied with it. Amputation of the finger, at the metacarpo-phalangeal joint, I have had heal in three weeks with one dressing, by using catgut ligatures, catgut sutures, and the catgut drainage skein invented by Mr. Chiene, of Edinburgh. The whole hand, after disinfection, is rolled up in cotton-wool, and at the end of three weeks or a month, on removing the dressing, the knots and parts of the drainage gut, outside of the wound, are found lying loose, the remainder having undergone absorption.

Lacerated and smashed fingers I always treat in this way, after previous thorough disinfection in carbolic acid, changing the dressing in from seven to ten days. Pain is materially less, the elastic support of the cotton-wool securing rest, healing is more rapid by this than by any method I have seen adopted, while trouble and expense are reduced to a minimum. Ulcers of the leg, the size of a shilling, have healed in six weeks with one dressing of the same, and a thick starch bandage over all, the patient being allowed to go about during treatment, which, before Dr. Martin's bandage came into use, was certainly satisfactory.

The lard, melting in consequence of the body-heat, causes an oily solution of boracic acid to permeate a certain depth into the wool, while boracic acid, in substance, remains deposited round the wound, and forms a thin hard deposit on the inner side of the dressing.

While attending Professor Billroth's Surgical Clinic, in Vienna, in the summer of 1878, I saw used, in many cases, a modification of Mr. Lister's dressing, which served admirably. Sprays were rather deficient in quality, but in spite of this many of his cases did remarkably well. The wound was first dressed, after Mr. Lister, with protective gauze in large quantities, and immense pads of cotton-wool over all, prepared with thymol and fixed with a permanent bandage.

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splint without finding some substitute, and after consideration concluded that the continuous extension which we then used for fracture of the femur would keep the limb straight and relieve the splint pressure on the joint. It did much more than I expected, because half an hour after its application the patient was so much relieved that he slept, and eventually made a good recovery. Since then my faith in the use of continuous extension in joint cases has been strong.

An excision of the breast, thyroid gland, or lymphomata from the neck, which are very large and common in Vienna, was left undisturbed a fortnight, unless the temperature showed something wrong, and, on removing the dressing, in a large majority of the cases these extensive wounds were found united throughout, except where the drainage tubes and sutures (silk was always used for ligatures and sutures) prevented it. If catgut had been used for ligatures, sutures, and as a drain, the dressing would, I think, have been a perfect one, and healing might have been complete in the same time, as, when antiseptics were thoroughly carried out, the result was invariably satisfactory.

The difference in the result of antiseptics, proper and improper, could be well studied in the same clinic.

The first assistant, who ranks as assistant surgeon and house surgeon combined in this country, believed entirely in Mr. Lister's theory and practice, and tried, in every particular, to carry it out, from what he had read and seen, but had never been with Mr. Lister himself; while the second assistant had studied for six months in Mr. Lister's wards. Pyæmia, erysipelas, and bad results were rife in the wards of the first, who was by far the better surgeon, and whose wards were superior; but in the wards of the second, during my stay, there never was a bad case.

In conclusion I append the following recent example:—

Mrs. M., age 54, was operated on for scirrhus cancer of breast, on December 3, 1880.

The breast was of large size, and in addition to the portions of skin removed by the ordinary elliptical incision, a piece which was 'moored' to the growth, of triangular shape, and of such size as to cause by its removal considerable tension on the edges of the vertical portion of the T-shaped wound left after completion of the operation, was also taken away.

The operation was conducted throughout with the most careful antiseptic precautions. Thick catgut ligatures were used to stop bleeding, and left long enough to hang out of the axillary end of the wound; two catgut skeins were stitched with catgut to two different portions of the pectoralis major, in such a position as to secure efficient drainage; 14 catgut sutures were used to carefully approximate the edges of the incisions, the upper flaps being necessarily tense from the amount of skin removed, and the wound covered up with a protecting towel dipped in carbolic lotion.

A piece of sheet cotton wadding already prepared for use, about 14 inches long and 8 inches broad, thickly spread with boracic ointment, was now exposed to the action of the spray, making the surface to be brought in contact with the wound moist with a layer of carbolic acid solution.

The spray was again turned on to the wound, the protecting towel removed, and the anointed dressing applied. A thick pad over this above and below the transverse incision, another large thick pad over the axillary end of the wound reaching round to the back, and three layers of sheet wadding kept in position by a flannel bandage, one foot broad and six yards long, firmly applied, to exert compression on the pads beneath, completed the dressing.

After-progress.—The operation was performed at 12, on December 3. Evening temperature 98°, pulse 112. Very sick from the chloroform.

Dec. 4.—Sickness continued till 2 a.m. Free from pain. Morning temperature 100°, pulse 100. Evening temperature 100·5°, pulse 108. Perspiring profusely.

Dec. 5.—Morning temperature 99°, pulse 100; perspiring. Evening temperature 100°, pulse 100, perspiring.

Dec. 6.—Morning temperature 97·5°, pulse 100; perspiring. Evening temperature 99°, pulse 105; perspiring.

From this date the temperature and pulse were normal, and appetite returned. Never has any pain. Perspiration occurs at night, as is habitual to her when in health.

Dec. 9.—Sat up for four hours, and walked about the room.

Dec. 18.—Dressing removed for the first time. It formed a firmly-applied hard jacket, the outside of which was free from any stain of discharge, but on the first applied layer of bandage a dry blood-stain, about the size of half a crown, and towards the centre, was exposed. The dressing was entirely free from odour, covered over the whole internal surface with bloody discharge, and contained the remains of the catgut sutures and drains.*

The wound was healed and the parts presented the puckered, shrivelled, and firm appearance of an old operation site.

**The surgical rule at this date in breast cases was to dress them twice daily on the first and second days, then daily for a few days longer. They were always drained with more than one large tube. Many years later I found it to be impossible to make surgeons believe that such large wounds could heal under a single dressing.*

1882

CASE OF AXILLARY ANEURYSM: LIGATURE OF THIRD PART OF SUBCLAVIAN ARTERY WITH CHROMICIZED CATGUT. CURE.

(Under the Care of Mr. Morison, Hartlepool Hospital.)

(*British Medical Journal,* April, 1882, p. 576.)

J. H., age 62, a thin wiry man, was admitted on November 22, 1881, having been told by a doctor that he was suffering from axillary aneurysm. He stated that he had been in the army for thirteen years, had drunk hard, and had lived a rough life. He gave no history of syphilis, nor of any accident. On examination, an aneurysm of the left axillary artery was readily recognized. It was of the size of a large lemon. It extended to immediately below the clavicle, pushed forward the anterior wall, and distended the floor of the axilla. Pain and swelling of the hand had occurred three months before, and ten days after that he noticed the pulsating swelling now present. There were no signs of disease of any internal organ. The arteries generally were harder than natural.

He remained in bed a fortnight under observation before operation, and, until the last three days, no bruit could be heard in the tumour. After a night of severe pain, a loud systolic murmur was then discovered in the morning. Coincidently a marked increase in size of the aneurysm occurred.

On Dec. 6, 1881, the patient having been brought under the influence of chloroform, the usual incision for ligature of the subclavian artery in its third part was made. The external jugular and transverse cervical veins were ligatured and divided. Some of the external fibres of the sterno-mastoid muscle were separated from the clavicle to allow the passing of the ligature round the artery, which lay deeper than normal on account of the upward displacement of the clavicle. The artery was ligatured with medium chromicized catgut. The ligature was drawn tight enough to arrest pulsation in the tumour, then a little tighter, and its ends were cut off short, after being tied in a reef-knot. Carbolized catgut was used as sutures, and several strands of catgut (the catgut drain of Mr. J. Chiene, of Edinburgh) as a drain. Antiseptic precautions were observed, and the wound was dressed with protective and gauze.

Dec. 7.—He had had an easier night than he had passed for some time. The temperature was normal. There was no pulsation in the radial artery on the side of operation. On account of sanguineous oozing, the dressings were changed. The aneurysm felt slightly resistant, and pulsated feebly.

Dec. 14.—The wound was dressed on this day, as the arm felt painful from having been confined so long in one position. Towards the upper part the aneurysm was quite hard, but over the greater portion of it there was strong pulsation. His temperature had not exceeded 99°, and in every respect he had felt well. The wound had healed by first intention. There was no pulsation in the radial artery.

On Dec. 21 the pulsation had disappeared, and the aneurysm was hard except at the lower and internal parts, over an area of about the size of a half-crown, where there was still strong pulsation.

It is unnecessary to relate the progress of the case, further than to say that this area of pulsation gradually disappeared until, at the end of a month, the whole contents of the aneurysm were firmly consolidated.

1885

NOTES ON "SEVENTEEN CASES OF VESICAL CALCULI."

(*Northumberland and Durham Medical Society: Published in Transactions*, November Meeting.)

Here are seventeen specimens taken by operation from fifteen bladders. In thirteen of the cases they were removed from the male bladder, and in two from the female. Of the male cases eleven were cut and two crushed. One of the lithotomies, a boy whose case I shall afterwards mention, was done by my brother, the rest are my own collection. The youngest patient operated on was two years, the oldest seventy-four. Of the whole series three died—two after lithotomy, one after lithotrity. Whilst showing you all the specimens in my possession, I will only mention such of them as have interest for any unusual history.

The fifth on my list was a boy, 11 years of age, from whom this specimen was taken. At the age of four he began to suffer from symptoms of stone, which increased in severity till sixteen months ago. Suddenly, after excessive pain, his symptoms disappeared, and for a year he was free from trouble of any sort. Four months ago (that is, before the operation) he began to feel his old symptoms returning. They gradually increased in severity till, for two months before the operation, he was obliged to remain in bed, propped with pillows, as he could not lie down. His urine constantly trickled away, his sufferings were continuous, and the least movement seemed agony to him. He was a pale, emaciated, sickly-looking boy, with rachitic bones, and a nearly bald head, who whined continually, and could not bear even to be looked at.

After giving him chloroform a sound was passed, which grated on a stone, just as if on entering the bladder. A finger in the rectum detected a stone projecting as far forward as the internal sphincter. The staff introduced previous to operating grated in the same way as the sound, and could not be moved with the same freedom as in an ordinary case after having reached the bladder. The knife came in contact with the stone when being pushed onwards in the groove of the staff, as in the ordinary lateral lithotomy operation.

My finger, introduced through the wound, entered a cavity, lined with calcareous matter, as large as the bladder, but lower down than it would be found in a boy of eleven. The stone was felt projecting into this cavity, but another portion enclosed in a sac pointed to the perineum, its tip reaching as far forward as the triangular ligament. The projecting portion was first seized, but being very soft it broke in the forceps. The encysted part was then, with some difficulty, detached, pushed back into the cavity, and withdrawn by the forceps. The whole stone formed a dumb-bell, the one knob being the well-developed calculus which you see in section here, the other knob being represented by the softer and more recent portion, which has been very much broken up by handling. Again introducing my finger, I found at the further end of the cavity the entrance to the bladder, further

from the perineum and more abdominal than usual ; but, dilating it easily, I found the bladder healthy, and its walls soft and smooth. A Clover's apparatus was now used to get rid of the débris and adherent matter, and the operation completed by inserting a drainage tube. This case must be a rare one, as I cannot find mention made of anything similar in all the surgical works I have consulted.*

If the patient had been an old man the condition would not have been so remarkable, as various similar cases are mentioned under the name of prostato-vesical calculi. The most probable course of events was, I think, that a small calculus passed down from the kidney into the bladder, where it gave rise to symptoms for more than five years. During severe straining it passed from the bladder into the dilatable prostatic urethra. It was arrested by the narrowest part of the canal except the orifice, that is, where the urethra passes through the posterior part of the triangular ligament. The urethra was dilated in consequence, and was pushed forwards and downwards by the stream of urine, so as to make the stone appear encysted. Here it remained quiescent for a year, gradually acquiring fresh additions to the end sticking out. A dumb-bell was formed and the prostatic urethra irritated, causing rapid phosphatic incrustation of the urethra, as found at the operation. The child recovered well.

Here I may draw your attention to this other stone taken from Case 3, a boy, age 6, and rickety. This stone, too, is a soft phosphatic one. Is this due to his diathesis ?

Case 6.—A large oxalate of lime calculus, weighing 4 oz., with phosphatic crust, removed from an old man, 72 years of age. At the time of the operation he was suffering from severe cystitis, and had frequent attacks of retention, necessitating the use of the catheter. The operation was done as a matter of necessity. The prostate was rigid, and on account of the size of the stone had to be incised on both sides. I do not think a much larger stone could be extracted by the lateral operation, as considerable force was required. The patient died exhausted, from vomiting, on the fourth day. No post-mortem could be obtained. Perhaps a better plan would have been to drain the bladder from the perineum, leaving the calculus, as the patient was a worn-out, dying old man when the operation was done.

Case 7.—A large oxalate of lime calculus from a man, age 40, who looked so ill that, on seeing him, my first impression was that he had entered

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* *Since this time I have had the opportunity of seeing either two or three similar cases, and so far as I have observed they are still not noticed in the literature of stone.*

The symptoms and signs are very definite, and the suffering produced exceeds that of any other stone cases.

All the patients have been children in the feeble condition of the case recorded. Their suffering is continuous from vesical and rectal tenesmus. The fixed stone can be readily felt from the rectum and a sound grates on it as described. In the other cases I have found the same dumb-bell stone, with the older end in the pouched prostatic urethra, the more recent in the bladder. My conclusion is that a bladder stone has become arrested in the prostatic urethra, and that fresh deposits of phosphates on the bladder end make it a dumb-bell, and cause incontinence, with urgent bladder pain.

the last stage of phthisis. His suffering was severe and constant from cystitis, which had commenced four months ago, and gradually increased. The layer of phosphates commencing to be deposited in the interstices of the stone show the presence of the cystitis. A little longer would have made such another as the previous stone, if the patient could have survived. His recovery from the operation was rapid, but on getting up he discovered that on attempting to urinate most of the water passed into the rectum, and had to be got rid of as an enema. On examining him I found a hole (large enough for the point of my forefinger to be introduced) in the anterior wall of the rectum. Either I cut the rectum at the time of the operation, or it sloughed afterwards from some injury inflicted on it. If I did cut it I was unaware of it, but I do not believe that any rectum will slough from such injury as the stone could inflict in being removed ; and, to be honest, I think it must therefore have been cut. This is more likely to have happened, too, as the lower end of the rectum was much dilated in consequence of prolapse from pain. The fistula has never healed, but by some combined internal and external muscular effort the patient can pass all his urine by the urethra, and is so well satisfied with himself that he will have nothing further done.

The next case is the one to whom this calculus belonged, which was taken from a boy, 6½ years old, by my brother. The patient was brought to me with a very much elongated œdematous and narrow prepuce, and (his mother said) pain when he passed water. I at once circumcised him, passed a sound, and struck a stone. On passing my finger into the rectum, I found my hand getting wet with discharge, and, examining the perineum, I found this to come from a sinus to the right side of the raphe of the perineum, and about the position of the centre of an ordinary lithotomy wound, except that it was opposite to the usual side. The discharge was evidently urine and pus, and a probe passed into the sinus went straight up to the stone. All the history we could get of it was that "a small lump broke there." The stone was obtained by the ordinary operation, and both sinus and wound healed.

The two crushed specimens are the result of four crushings done some years ago, before Bigelow's method had been introduced. They were done without chloroform. The first is from a patient, 72 years of age, who had at the time of the operations severe cystitis. He had three operations, and was cured. The second is from a man, 65 years of age, and is the result of one crushing. The operation was performed at home, and the same evening, fighting with his wife, he went into the yard. This was followed by a rigor and pneumonia, of which he died on the fourteenth day. No post-mortem could be obtained.

This specimen (an inch of broken cane knitting-needle) was taken from the bladder of a woman, 35 years of age. After trying ineffectually to remove it with forceps, I had to dilate the urethra, and then got it out.

The next specimen, a phosphatic stone, the size of a hazel nut, was taken from the bladder of a girl, 5 years of age. It was caught with a long pair of uterine forceps, and removed by steady traction. The urethra was slightly lacerated on its upper wall. Both these patients were well next day after operation.

1886.

WOUND TREATMENT.

(*The Northumberland and Durham Medical Society's Transactions*, February Meeting, 1886, p. 104.)

It is with some diffidence that I venture to bring before the Society this communication on the subject of wound treatment. My apology must be that for some years I have diligently thought over and worked at this subject, and have realized to a large extent practically what I supposed theoretically.

In 1878 I read a paper before the South Durham and Cleveland Medical Society on this matter, and in 1881 published the same (little altered) in the *Birmingham Quarterly Review*. In those papers the same principles were advocated as I am here to uphold to-night. Additional experience has served to convince me of their truthfulness and utility. At the onset I must confess myself a convert of Sir Joseph Lister's, and state my belief that when his details can be carried out in their entirety, wound complications of any sort are practically averted. There can equally, I believe, be little doubt that any mistake, allowing of putrefaction, leaves the wound and the patient in a worse plight than if no carbolic acid had come near the wounded surface. It will be allowed that the frequent removal of dressing, and with each the risk of wound contamination, the need of skilled assistance during the dressing, the carrying to and fro of the spray, the time spent in getting up steam, and the difficulty of making proper arrangements in a private house for all these complicated details, prevent a medical man in active practice from carrying out the ordinary Listerian formulæ. If I can prove that the antiseptic treatment may be carried out with ease to the practitioner in the house of his patient, to the saving of trouble, danger, and expense to the patient, then the object of my paper will have been gained; but if I can persuade you that the ordinary method of antiseptic wound treatment is faulty in many of the requirements for physiological wound healing, and can indicate a direction in which more perfect results are to be sought, and I believe found, it will add to my satisfaction.

The most uniformly satisfactory results in healing of wounds made by the surgeon are obtained by the subcutaneous method of operation—(in this class such operations as MacEwan's osteotomy should be included, as they are practically subcutaneous). It may,

therefore, serve a good purpose to consider in what respects subcutaneously-made wounds differ from open ones, and to ascertain if a closer imitation of the conditions favourable to subcutaneous healing may not lead to better results than those forms of wound treatment ordinarily adopted. In such a wound: (1) Air and chemical irritants are excluded. (2) Pressure is exercised on the wounded structures by the undivided elastic skin. (3) Heat is retained by the undivided superficial parts. (4) There is no mechanical interference with the wounded structures, no dressing, no drainage tubes, no removal of sutures, no expulsion of ligatures. Such a wound will heal with a minimum of pain, constitutional disturbances or inflammatory swelling—the equivalent to serous oozing of the open wound. Of the four conditions favourable to the healing of subcutaneous wounds, I have put in order of merit:—

1. *Exclusion of Air.*—That aseptic air does no injury to a wound is universally taught, and, as I cannot doubt that the carbolic spray destroys all injurious matter in the air, then my belief is that the antiseptic method makes the open wound equal to the subcutaneous one so far as concerns this first condition, with one exception. The one drawback of the antiseptic to the wound is that irritation follows its use, and an important consequence, serous discharge, results.

2. *Pressure is Exercised by the Undivided Skin and Superficial Structures.*—In simple cases, e.g., dividing tibialis posticus, where the tissues are young and elastic, their unaided elasticity is sufficient to secure perfect recovery without pain or swelling. That pressure is an important preventive of these complications (pain and swelling), in subcutaneous operations, may be proved by performing subcutaneous section of the contracted hamstrings on both legs of an individual unfortunate enough to require this measure.

On one leg, after tenotomy, close the puncture with collodion, and do nothing further. To the other, apply a bandage from the toes upwards and firmly over a thick layer of cotton-wool wrapped round the limb from below the knee to the middle of the thigh. If about the seventh day the legs be examined, the first will be found still swollen, tender, and deeply discoloured; the second will be free from tenderness or swelling, with traces of green discoloration remaining. The importance of properly applied firm pressure, as a principle in surgery, is not, in my opinion, sufficiently recognized. As a curative measure it has been extensively and successfully adopted; but as a preventive of inflammation and its results it has passed unnoticed. Yet there is no single item of wound treatment so important in limiting the inflammatory process to constructive action.

The series of cases used later as illustrations may not serve sufficiently to show my respect for firmly-applied pressure, so at the

risk of becoming tiresome, I will impress this with examples. Whoever has excised a wen from the head, antiseptically or otherwise, will remember thinking the wound left a trifling one to drain, and covering it up with a dressing without having taken this precaution. Healing of the wound takes place, if not purposely prevented, by first intention. Pus forms in the cavity, union (at first apparently perfect) breaks down, and healing is delayed to the disappointment of patient and surgeon. A pad covering the wound and pressed upon the surrounding tissues by a firm bandage prevents this trouble and makes drainage unnecessary. The following case illustrates well the powerful effect of pressure in limiting reaction, unfortunately in this case for evil :—

After performing on a girl of 23 the ordinary plastic operation for new nose, with a flap from the forehead, I sluiced the forehead gap with carbolic glycerin (1–10), sprinkled it with iodoform, and covered it with a thick pad of wool, fixed by a firm bandage round the occiput. As no complaint was made of pain, and there was no discharge, this was left untouched for three weeks. The nose being then healed, the dressing was renewed, when, to my disappointment and surprise, I found the wound precisely as when made, with the exception that the edges were glazed with a thin layer of lymph. A few days after, under ordinary dressing, the whole surface was granulating satisfactorily, and healing quickly followed.

Again, why have plasters such a popular reputation for preventing gathered breasts ? Because they often succeed, and will always succeed, if well applied and in proper time. Not on account of the medicinal substance contained, be it even belladonna, but because inflammatory congestion of the breast may be prevented, possibly not cured, by carefully-applied firm pressure. As a last example, allow me to point to the healing of ulcers under Martin's bandage. Pressure and retention of heat are here the important elements. Secure these by any means, and healing will similarly progress. To proceed with the subcutaneous wound :—

3. *Heat is Retained by the Undivided Superficial Parts.*—In no vital process is the value of heat more evident than in the healing of wounds. Does heat not play *the* important part in wounds of the mouth, where in spite of the frequent movements to which they are subjected, the constant contact with foreign material, and the septic atmosphere by which they are surrounded, healing readily and rapidly occurs ?

4. *There is no Mechanical Interference with the Wounded Structures.*—No dressings, no removal of sutures, no drainage tubes, and no ligatures to expel as foreign bodies. It must be apparent that the absence of all these disturbing influences is a considerable factor in securing that perfect rest necessary for perfect repair.

So far it has only been my endeavour to suggest those principles which should be the surgeon's guide in wound treatment. Going now from principles to practice, I will first describe my procedure—a modification of the ordinary antiseptic method,—and its results.

Take a case of excision of the breast and axillary glands as an example. The hands of the operator and his assistant, and the skin of the patient, are first thoroughly purified with strong carbolic lotion, the instruments kept in a 1–40 solution, and the spray turned on the site of the operation, which is completed in the usual way under the spray. Sponges wrung as dry as possible out of 1–40 lotion are used to find the bleeding points. These are ligatured with carbolized catgut ligatures, long enough when tied to allow of both ends hanging out of the axillary end of the wound. Every possible bleeding point is ligatured. The ligatures are now connected into one bundle, which is left hanging out of the most dependent part of the wound. The skin flaps are brought into close apposition over the raw surface and the body of the ligatures by a continuous suture of thick catgut, the needle carrying which is introduced, and emerges about a quarter of an inch from each margin of the incision, giving the suture a good bite of the tissues. In the interval between each visible loop of catgut a fine interrupted suture of catgut is placed, bringing the skin edges into perfect apposition. The surface and arm are now cleansed, the tails of ligatures cut off flush with the wound at their points of exit, and the whole covered with a thin layer of gauze wrung out of 1–40 carbolic lotion. A small pad of antiseptic wool is now placed over where the ligatures emerge, and is covered by another long narrow pad, the upper end of which fills the axilla, and the body of which is placed downwards against the lateral chest wall and kept in position by the upper arm pressed against it. The dressing is completed by a pad anteriorly and a large pad posteriorly, reaching from the spine well round the upper arm and from the shoulder-tip to the elbow. The dressings and arm being held firmly in position, the patient is drawn up over the head of the table, and the arm with the dressings are firmly bandaged in position with a long, broad, and strong flannel bandage, only half of the forearm being left free.

The course of a case so treated will be as follows: On the second evening after operation, the temperature will reach its highest record, 99 to 101; on the fourth day the patient will sit up in bed; from the fifth to the seventh day she will get up, walk to a chair, and sit up for a time; from the tenth to the twelfth day, in fine weather, she will get out; from the fourteenth to the twenty-first day, depending on the stoutness of the patient, the dressing will be removed for the first time, and the wound will be found firmly healed, with the exception of a granulating area from the size of a threepenny bit to a one shilling

piece over the site of exit of ligatures. In the dressing will be found the dried and unabsorbed remnants of catgut sutures and ligatures, and some blood staining, the result of from 1 drachm to 1 ounce of discharge. The fixed position of the arm and some aching of the back are likely to be the only complaints when pain is enquired for. Such has been the exact course followed in my last eight cases of excision of the breast, without open sore, except in the last case. This was an old lady of 73, for whom, by mistake, chromic acid catgut sutures were used. These sutures had not been absorbed at the end of three weeks, and on their removal left little punctures, which prolonged healing. In three of these eight cases the glands and surrounding cellular tissue were cleared out of the axilla.

Of the last four amputations I have performed, two have been perfect in result. The first, a boy, whose foot and leg were smashed on the railway; amputation by two equal antero-posterior flaps was done below the middle of the leg. Healing was complete in a fortnight, when the first dressing was taken off. There was no rise of temperature, and no complaint of pain was ever made.

The second, a patient 33 years old, with advanced chronic phthisis, had painful suppurating strumous disease of the wrist. Amputation of the forearm below the middle was performed by equal antero-posterior flaps. This patient never went to bed; was out walking next day; and at the end of a fortnight, when the first dressing was removed, had healed, except a small granulating area which closed in a few more days. The third, a patient, 63 years of age, for advanced senile gangrene of the foot, had her leg amputated by Spence's method —a long posterior flap at the seat of election. The first dressing was removed under the spray three weeks after the operation. No discharge had appeared through the dressing. The flap was found ununited in front, and at this part, three inches across and one inch vertically in the centre, the skin and cellular tissues were gangrenous. A similar dressing was reapplied, and at the end of a week the wound was redressed, and the slough found not to have increased. At the end of three weeks again, curiosity prompted an examination of the stump. The slough had separated, and a healthy granulating surface was exposed. Another dressing was left on for six weeks, when the stump was found to be firmly healed. In this case the temperature and pulse were normal throughout, but pain was constantly complained of in the stump. As this pain continues, it is probably due to the hyperæsthetic state of the patient, who aggravates her ailments by indulging in laudanum and whisky. The fourth case, patient aged 67; amputation by equal antero-posterior flaps at lower third of leg, for strumous disease of lower end of fibula, ankle-joint, and tarsus. The operation was done in the afternoon, with failing light.

The vessels had to be secured by the light of a candle, and possibly some detail of the antiseptic was interfered with. The result was that a stain appeared on the dressings on the third day, when they were removed by his medical attendant, under whose care he recovered satisfactorily with ordinary dressings.

In compound fractures, my experience has been that free oozing occurs for the first three or four days, probably in part on account of the antiseptic employed to correct the mischief already done by exposure, and in part to the discharge from the broken bone surfaces. After two or three dressings they may be put up permanently with the dressing I have indicated, and a plaster bandage, the catgut skein of Professor Chiene being first introduced at a dependent opening.

Treated in this way, a compound fracture will occasion little trouble, and will usually be found united and healed at the end of eight or ten weeks.

In my last case of excision of the knee, in a boy of eight, the first dressing was removed on the third day. The dressing was renewed with a plaster bandage from the toes, up to the leg, and round the pelvis. Nothing further was done for six weeks, when the dressing was taken off, and the wound found to be firmly healed. I have always found it necessary to change the dressings once or twice during the early days when a spongy bone has been divided, as oozing occurs from the cut surfaces which cannot be controlled by external pressure.

In the case of removal of tumours, if the wounded surface left is in a suitable position for the effectual application of pressure, and the thorough carrying out of the antiseptic system, I never fail to get healing with one dressing. For large tumours of the neck, an elaborate bandage covering the head, neck, and upper part of the chest, fixed below by a turn round the upper arms, and held rigid by a starch bandage over all, seems to me the best method of using a permanent dressing in this situation.

But every method has its disadvantages. Here these are:

(1) The great care required at the operation and in applying the first dressing, and the consequently longer time that the patient is kept on the operating table. The chief cause of failure I believe to be want of the strictest attention to antiseptic precautions. In three cases of fungating breast cancer I have failed to purify the surface sufficiently to get a perfect result. To call a profusely suppurating wound antiseptic, because the discharge smells sweet, is absurd. All such discharge has been proved to teem with bacteria. Sir Joseph Lister teaches that suppuration in a wound arises only from putrefaction, tension, or antiseptic irritation, and he impresses always the fact that in a properly-drained antiseptic wound there should be no pus form-

ation, and it cannot be too strongly insisted on that there is not. Only this high standard of antiseptics will suffice.

2. The objection that, if after-bleeding occur, such an amount of blood may be lost into the dressings before its appearance externally as to prove dangerous.

3. That the patient and surgeon have not the satisfaction of seeing how things are going on.

4. That failure means loss of time and trouble wasted.

These objections scarcely require any answer. Success, with greater ease, is acquired by increased experience.

To conclude: (1) All operations, when possible, should be performed with antiseptic precautions. (2) When this is done, a single dressing should suffice in the majority of ordinary surgical operations, such as amputations of breasts, limbs, or tumours. (3) This does suffice if the principles underlying the healing of subcutaneous wounds be recognized and acted on. (4) My method has been sufficiently indicated, and is shortly:—

a. To render the air aseptic with carbolic spray.

b. To exercise firm pressure with a soft absorbent pad impregnated with a non-volatile antiseptic.

c. To retain heat by securing early union, and by a warm dressing.

d. To disturb the wound as little as possible by using non-irritating, early-absorbable animal ligatures, which serve sufficiently for drainage purposes if undue sluicing of the wound with antiseptics be not indulged in, and by using the same material for sutures.

FOREIGN BODY IN TRACHEA.

(*Northumberland and Durham Medical Society's Transactions*, February, 1886, p. 32.)

This small plum-stone I recently removed from the trachea of a child six years of age. After eating some fruit the little patient had a sudden attack of dyspnœa, in which she was nearly asphyxiated. On recovering slightly, she said she had swallowed two plum-stones, and these, the medical gentleman who had been called in said he had pushed down the throat. During the same night, however, the child had a second attack, in which the face became quite livid. Next morning the doctor again saw her, and for a week she was treated for bronchitis. A week after the first attack the child was brought to me, the mother stating that it still had attacks of dyspnœa during the night; and on close examination I discovered that there was still some obstruction to the breathing, and that this was accompanied

by a cough of distinctly croupy character. The episternal space, the epigastrium, and intercostal spaces were retracted at each inspiration, and there was whistling to be heard over the upper parts of the lungs on auscultation. I had no doubt, considering all the symptoms together, of the presence of a foreign body in the trachea, and proposed tracheotomy. In operating on such cases, Spence recommends that chloroform should be dispensed with, but I determined to give an anæsthetic in this case. I exposed the trachea, laid it bare all round, and drew it forward into the wound with a sharp hook. I then drew down the isthmus of the thyroid with a blunt hook, and opened the trachea. Taking the handle of the scalpel I inserted it, sloping into the wound in such a way as to guide the body easily out should it be coughed up; and after waiting a little, I was rewarded with one or two slight coughs, and then a stronger effort was followed by a 'blob,' as the stone flew out of the wound, and struck me in the face. A tracheotomy tube was now put into the wound to prevent a cellular emphysema, and in a few days the child was quite well.*

NOTES OF A CASE OF SUPRAPUBIC LITHOTOMY.

(*The British Medical Journal*, May, 1886, p. 817.)

Removal of three pure uric acid stones; largest, about the size of a cocoanut, weighing one pound six and three-quarter ounces; long circumference 12 inches, short circumference 9¾ inches.

S., age 52, married, a seafaring man, residing at West Hartlepool, complained of difficulty with his urine. His general health had been good with the exception of the trouble complained of. He had been somewhat addicted to alcoholic excess. He looked a strong man; but much worn by pain and loss of rest.

For the last thirty years he had had attacks of pain and difficulty in micturition. He thought that an accident, a fall on the perineum over a railing, which he met with when a boy, might have been the cause. During the attacks he had a frequent desire to micturate, accompanied by straining pains in the perineum and rectum, and a shooting into the point of the penis. These attacks lasted a variable time, occasionally passing off in a few days' time, at other times requiring months. He said they had to reach a height, after which followed a gradual return to health, and for a time he remained perfectly well. Several years ago during one of the attacks he passed blood with his urine. At different times he had consulted a variety of physicians and surgeons; but nothing did him any good except morphine, which relieved his pain. He had been frequently sounded for stone, but without result.

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* *This case might now*, 1915, *be treated by means of the bronchoscope, and a cutting operation avoided.*

URIC ACID CALCULUS REMOVED BY MR. MORISON BY THE SUPRAPUBIC OPERATION.
Exact size. Weight 11b. 6 oz. 6 dr. Measurements: Long circumference, 12 in.; Short circumferenee, 9¾ in.
The grooves are channels along which urine passed.

His present attack began four months ago in the usual way, with painful and frequent micturition, for which, up to the time of my seeing him, he had been under medical care, and steadily becoming worse. At the time of my first seeing him, I was going away for three weeks; therefore on examining his urine, and finding it to contain one-third albumin, some pus, and to be of a low specific gravity (1008), I ordered him to live on milk, and to take 15 minims of tincture of perchloride of iron three times a day, postponing any instrumental interference till my return.

On August 14, three weeks having expired, I again visited him. So far as could be ascertained, all his organs were healthy, with the exception of the genito-urinary system. He was wearing a urinal, as his urine was constantly dribbling away. As a consequence, his thighs were excoriated, and he had a strong urinous odour. On palpation, a rounded swelling could be felt in his lower abdomen, reaching midway between the umbilicus and pubes, which was dull on percussion, and pressure on which caused a desire to micturate, and the escape of some urine by the natural channel. Pressure over both kidneys, posteriorly, caused pain. By the rectum, a round, hard, tender swelling was easily felt, projecting into the lower part. A soft rubber catheter entered as far, apparently, as the prostatic urethra, but here it hitched, causing great pain, and about a teaspoonful of urine escaped in little gushes. The catheter could not enter the bladder. After explaining that, in his dangerous state, even the passing of an instrument and the emptying of his bladder was attended by considerable risk, I arranged to give him chloroform the following day, and make a thorough exploration.

Aug. 15.—On giving chloroform, the distended bladder could be distinctly felt as a rounded swelling in the lower abdomen. A soft *coudé* instrument struck at the same spot as the one introduced yesterday, and no more urine could be obtained through it. A silver catheter now tried struck a stone at the point of obstruction lying in the urethra, and could not be passed beyond it. I arranged to make an incision, and by that means empty his bladder the next day.

Aug. 16.—The staff when introduced hitched on the urethral calculus, but passed on into the bladder where it struck another calculus. The ordinary (as for lateral lithotomy) incision was now made, and bled profusely from the whole surface. The transverse perineal artery was so active as to be formidable, and a Pean's forceps was fixed on each end. When the urethra had been incised, a small flat stone escaped into the wound, and was extracted with my finger, which was then passed into the bladder on to the stone there, and the staff was removed. The stone was of such large size that I enlarged the wound in the bladder with a probe-pointed bistoury before introducing the largest size of lithotomy forceps. Expanding the forceps widely, I grasped the stone, which was so large and of such a shape that the instrument slipped off. After repeating the process in a variety of directions, it was plain that the stone could not be removed through this incision, and that, if the stone were to be had, it must be by the suprapubic operation. The wound had all along bled profusely from its whole surface, and by this time the patient had lost a pint of blood. A sponge was packed into the perineal wound, the suprapubic incision made, and the bladder opened above the pubes on the stone; a matter of little difficulty, as the stone was pushing forwards the anterior bladder wall. The incision in the skin was extended upwards for about four inches from the pubic bone, the bladder-wall being opened for about two inches up to the reflection of the peritoneum. The lithotomy-forceps

was again introduced, but had no power, and slipped. There was the same difficulty as before. The midwifery forceps of a neighbouring practitioner was now sent for, and on its arrival, one blade was introduced at a time, as in an ordinary instrumental delivery. The entrance of the first blade was followed by a gush of putrid urine, which escaped over the abdominal wound, and must inevitably have run into the peritoneal cavity had it been opened. This urine, about two ounces, was lying in the base of the bladder under the stone, and at a lower level than the urethral opening. The forceps being locked, the stone was easily removed by slow and gentle traction, the wound in the bladder expanding without laceration, and no further obstruction being encountered because of the long incision through the superficial soft parts. The bladder-wall was very much thickened, and so vascular that it bled freely. Lying at the lowest part of the bladder was another small flat stone, which was now removed.

The operation was completed by the introduction of two deep and three superficial sutures of catgut into the abdominal wound, leaving only the lower half open; by stitching a full-sized drainage tube reaching the bladder into the perineal wound; by flushing out the bladder and wounds with boracic lotion; and, finally, by the introduction of a large sponge, with Pean's forceps attached, into the bladder to stop the oozing from its interior still going on. The operation occupied three-quarters of an hour, including the delay occasioned by having to send for forceps.

An hour afterwards the sponge in the bladder was removed by means of the Pean's forceps, which was left attached, and all the bleeding had ceased. The patient had a fair pulse, but had not yet rallied from the cold, chloroform, and shock.

Aug. 16, evening.—Fair pulse, 110; temperature 97. He had not yet recovered from the shock, and was inclined to be cold. A hypodermic injection of one-sixth of a grain of morphine was made, and some hot milk and water given.

Aug. 17, morning.—Temperature 97. The hands were still cool, but the body warm and perspiring. He had had a good night; he had slept three or four hours, and had taken milk freely without sickness. 1 p.m., temp. 97·6, pulse 112; 3.40 p.m., temp. 99, pulse 120; 10 p.m., temp. 102·6, pulse 160. Ten grains of quinine and ten grains of compound ipecacuanha powder were ordered.

Aug. 18.—1 a.m., temp. 100·2, pulse 140; 8.20 a.m., temp. 97·4; 3.20 p.m., temp. 98·8; 8 p.m., temp. 99, pulse 117. After this his temperature only once reached 100. For several nights he required morphine to make him sleep, not because of pain, but of restlessness.

Aug. 19.—Most of the urine escaped by the abdominal incision, in spite of the fact that the perineal tube was large and patent. The tube was removed as a consequence. The secretion of urine was very free, and had been ever since the operation. To-day he took a quantity of egg-flip; he looked much better, but his tongue was dry, and he was disposed to hiccough. One grain of calomel was ordered to be taken every four hours.

Aug. 21.—His pulse occasionally intermitted, and had kept up to about 120 since the operation. He was ordered 10 minims of tincture of digitalis every four hours. The tongue was much cleaner. He asked for and relished some tea and toast.

Aug. 22.—Most of the urine escaped through the abdominal wound; and a tendency, apparently, for it to find its way into the urethra had caused some pain. I passed a full-sized drainage tube through from the perineal to the abdominal opening, and ordered the bladder and tube

to be syringed out from above every four hours with warm boracic lotion. The patient seemed very well and strong; pulse 100, temperature normal. He could not, however, sleep well at night; the urinary secretion was very free.

Aug. 27.—He was very well and strong, the upper part of the abdominal wound was healed; the lower part was granulating, and both it and the perineal wound had closed in so as to embrace the drainage tubes. His diet had been gradually improving; to-day he was allowed to have for dinner chicken with vegetables, pudding, and a glass of beer. After dinner he enjoyed a smoke, and was anxious to know if he soon could get up a little. He was in excellent spirits about himself.

Aug. 28, morning.—He looked rather depressed, and said he did not feel in such good spirits. He had had hiccough occasionally, but as his pulse was good and temperature normal, the wounds looked well, and the secretion of urine was free, no importance was attached to it, as, even when fairly well for some months, he had sometimes had it. In the evening the hiccough was much worse; it never let him rest. The tongue was dry; pulse 120, temperature 98·4. He was very thirsty, drowsy-looking, and low-spirited. He said he was going to die. Hypodermic injection of morphine and a variety of other things were tried.

Aug. 29.—The hiccough never ceased. He had been delirious all night, wanting to get out of bed, etc. He died early in the morning. No post-mortem examination could be obtained, though there could be little doubt from the history and his condition that the ureters were dilated and the kidneys diseased.

1887

CHONDROMA OF FIBULA.

(*Northumberland and Durham Medical Society's Transactions*, December Meeting.)

Two years ago this patient came to me complaining of pain and swelling in her ankle. Her history was—that the night before seeing me she knocked her ankle, causing great pain in it, and, on undressing, found it swollen for the first time. On examination, I found what I took to be a tumour growing from the lower end and inner surface of the fibula, and separating the two bones from each other.

In January, 1886, I removed the growth by operation. An incision about 3½ inches long was made over the outer surface of the fibula. The structures, extensor tendons, vessels, etc., on the front of the ankle were separated from the anterior surface of the tumour; the peronei tendons were divided on the outside; the structures, tendo Achillis, etc., at the lower part of the ankle, were separated from the posterior part of the growth; the fibula divided well above the tumour, and its lower end separated from its attachments by division of the ligaments on the outer surface of the tibia. A further dissection exposed this bony attachment, which was divided with a hammer and chisel. The wound was now dressed in the usual way.

The parts removed were exhibited at a previous meeting of the Society in their fresh state. They consisted of a cartilaginous tumour, about the size of a tangerine orange, with the 2½ inches of lower end of fibula which was expanded over and closely attached to the tumour. On the opposite side of the tumour a divided surface, about the size of a halfpenny piece, showed the point of attachment to the tibia.

The patient can now walk without limp, dance, and jump on the leg which has been operated on as well as on the other. In every respect but the known absence of the lower end of the fibula, the limb is perfect.

The three points of interest in the case are: (1) The misleading history of accident as a cause. (2) That no recurrence of the tumour has taken place. (3) The perfect recovery after removal of so much fibula, and necessarily exposure and manipulation of the ankle-joint.*

CASE OF EXCISION OF ELBOW.

This boy had ordinary gelatinous disease of the elbow, in which suppuration was just commencing. A year ago I excised his elbow in the usual way, and have brought him forward to show you the result. With

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* *I saw her many years later, quite well.*

his shirt on, it is impossible to say which arm has been operated on. The movements of flexion and extension pronation and supination, as you see, are perfect. This result I attribute to an early operation, and to movement begun soon after. Pus was found in the joint, but had not burrowed through the capsule and disorganized the soft parts. Movement was begun on the fourth day after operation.

CASE OF ORBITAL ANEURYSM.

(*Northumberland and Durham Medical Society's Transactions*, January Meeting.)

A. C., age 7½ years, was sent to me by Dr. Munro, Haverton Hill, with exophthalmos and a bruit to be heard over the greater part of the head.

The history of the boy's illness is that, a year last October, he was sitting on a wall, 2½ feet high, with a clasp knife open in his hand. He fell forwards, and on coming to the ground the knife entered his right orbital cavity in the position of a scar about the centre of the lower eyelid. He walked into the house with the knife sticking out, the blade being entirely hidden, and the handle standing straight out from the face. His mother at once tried to pull it out, but finding it fixed left it till his father came in. The father pulled it out, and it required considerable force. As soon as the knife was withdrawn a gush of blood followed, and about a tablespoonful of blood escaped. The eye (which, before the knife was pulled out, seemed pushed in) at once started forwards when the knife was withdrawn. Dr. Munro was in attendance at once; but no further bleeding took place. The boy could see immediately after the accident, and his sight had not totally disappeared till two or three weeks ago. Two or three months after the accident, the protrusion of the eye having somewhat lessened, at Dr. Munro's suggestion an ophthalmoscopic examination was made, and the only thing found was some dilatation of the veins of the fundus. The subconjunctival vessels were at this time much more enlarged than they now are. Six or seven weeks after the injury the exophthalmos was most marked. It diminished after this up to about three months after the accident, since when no further change has occurred. He was always able to close the lids fully. There has never been any visible pulsation, but since the third or fourth day there has been pulsation on pressure on the eyelid, and a loud bruit could be always heard from this time.*

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* *Dr. Munro writes, Oct.* 6, 1914: "*The accident occurred in* 1887. *The eye was removed in* 1892 *on account of severe inflammation of the useless bulb. Previous to this operation he complained of a constant noise in his head, in his own words,* '*like a steam engine constantly working.*' *Since the eye was removed that or* any *noise has quite gone. I could hear no bruit when I examined him yesterday.*"

1888

CASE OF UNILATERAL TONGUE PARALYSIS FROM INJURY TO HYPOGLOSSAL NERVE.

(*The British Medical Journal*, July, 1888, p. 75.)

In Vol. iii. of the Clinical Society's "Transactions," Sir James Paget reports a case of injury to the occipital bone, followed by paralysis of the right half of the tongue, due to pressure on the hypoglossal nerve. This being the only recorded case known to me, I think notes of a similar one may be of interest.

A young lady, age 16, a patient of Dr. Longford, of Thirsk, to whom I am indebted for notes on the case, consulted me in May of this year about her tongue. On Nov. 20, 1886, in jumping over a ditch, she landed awkwardly on her feet, and felt the upper part of her neck strained. Immediately after she noticed something wrong with her tongue, which felt, when she tried to move it, as if it rolled round in her mouth. The following day Dr. Longford was sent for, and diagnosed the condition. Her companions laughed at her for talking thickly. She was sent home, when the family doctor saw her, laughed at the diagnosis, and said it was all stomach. Eighteen months after the injury I saw her. There was then marked atrophy of the right half of her tongue, giving it a peculiar wrinkled, shrunken appearance. It was only about quarter the size of the healthy side; speech was still considerably affected. Dr. Longford informs me now of slow improvement.

It will be remembered that the hypoglossal nerve leaves the skull by the anterior condyloid foramen of the occipital bone, in front of the insertion of the vertebral column. After making dissections of this region, I concluded that bruising of the nerve followed by hæmorrhage into its sheath may have been caused by a driving up of the vertebral column, and squeezing of the nerve between it and the base of the skull, which the elasticity of the base of the skull in a young subject might allow of, or that the nerve may have been stretched over the long transverse process of the atlas by an awkward twist of the head.

VILLOUS TUMOUR REMOVED FROM BLADDER BY SUPRA-PUBIC OPENING.

(*Northumberland and Durham Medical Society: Reported in Transactions*, October, 1888.)

W. H., age 63, Tow Law, a patient of Dr. Hood.

Complains of blood passing with his water.

Previous Health.—Thirty years ago was in America, and had typhoid fever. He had been troubled occasionally with outbreaks of psoriasis, of which he still had a patch here and there. With these exceptions he had been very healthy.

He had drunk a good deal of beer—more than was good for him—but had not been decidedly intemperate.

Family History.—There was nothing worthy of note.

History of Present Illness.—A little more than two years ago he first noticed blood in his water. There was no pain to draw his attention to the fact, and he only discovered it accidentally by seeing the colour of his water. A large quantity of blood passed at this time. It was not clotted, but thick, and the colour of porter. He got medicine from his doctor, and the quantity of blood got less, but never disappeared. At times there was less than others, and a little extra exertion increased the quantity. Six months ago he first began to have pain, when clots came with the water and blocked the passage, causing pain and straining.

He kept his colour well, except that he was a little pale at times, till the last two months. Since then he had lost a stone in weight, being reduced from 14 stone to 13 stone; had become pale, giddy in his head, and troubled with shortness of breath, palpitation, and squeamish attacks.

Present Condition.—The patient was a well-made, fair man, of average height and stout build. He was bleached from loss of blood, and was evidently incapable of any exertion. His legs and feet were considerably swollen, and pitted on pressure. In spite of his condition he was cheerful, and not inclined to take a very serious view of the situation.

On examination a tumour was discovered in the left hypochondrium, which could be pressed into the lumbar region and felt with difficulty between two hands—one behind, the other in front. It descended freely on inspiration, felt firm, smooth, not tender, and had a sharp edge. No notch could be found, and owing to the stoutness of the patient it was difficult for me to decide whether it was spleen or kidney. Dr. Drummond, who kindly saw the patient with me and interested himself in the case, thought the tumour was spleen, that there was no evidence of kidney disease or tumour, and that the hæmorrhage was probably of vesical origin.

When I saw him micturate the stream was free and equally blood-coloured from beginning to end.

The urine was normal in every respect, except that it contained a very large proportion of blood, and one-third albumin. The blood was sometimes clotted. The clots were mostly of an irregular, flattened shape. On one occasion a worm-like clot, which might have been formed in ureter or urethra, was found. No pieces of growth could be discovered after the most careful search. A sound passed into the bladder showed that it was of normal elasticity, and not abnormally tender. The prostate and base of the bladder were healthy. The passage of the sound and its manipulation in the bladder were followed by no increase of the bleeding.

A fortnight later the old gentleman, having arranged his affairs and decided to undergo whatever operation was necessary, was anæsthetised.

I began by passing one of the large-eyed catheters used in lithotrity, hoping that if there was a vesical growth a portion of it might be caught in the eye of the instrument and brought away. This manœuvre was not a success. An aspirator was now applied to the catheter, and boracic lotion pumped into and out of the bladder, without result.

I now passed a lithotrite, and made the same systematic search of the bladder as is done for stone. At the third opening and closing of the instrument, finding something grasped, I withdrew the lithotrite, and was rewarded by finding a piece of the specimen exhibited—an unmistakable villous growth.

Once more I passed the lithotrity catheter, and used the aspirator syringe, this time to see whether bleeding had been increased to such an extent as to necessitate immediate opening of the bladder, which I came prepared to do. Several large detached pieces of growth were washed out by this means, and as the bleeding was not increased by what had been done, and as it was not impossible that the whole growth might have come away, further operation was postponed.

Five days later, on July 15th, 1888, the supra-pubic operation was performed. The incision was done in the usual way, the edges of the bladder being held by artery forceps. A soft, finger-like growth was found in the neighbourhood of the right ureter. It had a distinct pedicle, and there was no induration of the bladder wall at the point of its origin. It broke in the polypus forceps used for its extraction, and had to be removed in pieces. An india-rubber tube was left in the bladder through the wound, and the patient put to bed in a very favourable state.

After-progress.—All bleeding from the bladder ceased after the operation, and has never returned.

There is nothing to note in his recovery except that it may have been somewhat retarded by dyspeptic symptoms, sleeplessness, and nervousness.

On the 15th day urine passed by the urethra.

On the 28th day he left Newcastle for home, with only a very small granulating wound remaining.

I recently hear that this healed in a few days, and that his health is so far restored that he is able to carry on his business as formerly.*

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* *The after-history of this case is a frequent one in similar instances. Three and a half years after the operation, he came back with recurrence of the hæmaturia, and was relieved by a second operation. Eighteen months later hæmorrhage recurred, and operation disclosed a papilloma of the bladder with infiltrated base. Five and a half years after the first operation he died from the effects of cancer of the bladder.*

1889.

BREAST TUMOURS.

(*Northumberland and Durham Medical Society's Transactions*, January, 1889.)

Case 1.—This large tumour, weighing 4½ lb., was removed by me from a woman of 38, last month. The case is interesting as it illustrates in one person the close connection between sarcoma, tuberculosis, and Hodgkin's disease, and the difficulty in some instances of saying where one begins and the other ends.

I saw the patient first two and a half years ago, when she called upon me on account of swellings on each side of her neck. She was in poor general health. On each side of the neck there were large masses of glands. The supraclavicular, axillary, and inguinal glands were also involved; and this fact, together with the anæmia and debility present, led me to regard the case as one of Hodgkin's disease. Under treatment by arsenic the general condition improved, and, with the exception of some glandular enlargement on the right side of the neck, the swellings disappeared. Six months after the commencement of the illness, one of the neck glands suppurated. I opened the abscess, and at the same time scooped out some softened degenerated gland, resembling an ordinary strumous gland. At this time my attention was drawn to a swelling in the breast. I may mention that the family history was tuberculous.

In the upper part of the breast a firm, even, wedge-shaped swelling, with apex of wedge towards nipple, was felt. This was marked when the portion of breast affected was grasped between the fingers, but nothing could be felt on putting the flat hand over the mass with the patient lying on her back. The axillary glands on both sides had again become somewhat enlarged. From this examination I concluded that the breast swelling was due to chronic inflammation of a similar nature to that affecting the glands. It was evidently no tumour. She again took arsenic. A second time suppuration occurred in some of the neck glands, and under ether the abscess was opened, and the diseased glands, similar in character to the first, removed by scooping. On both occasions the wounds healed quickly, and without causing trouble.

Little change was noticed in the breast for the first year except that it varied in size from time to time. During the second year it increased slowly in size, and could be defined in such a way as to make me suspicious of tumour formation. Three months before the operation I saw the patient, but could arrive at nothing more definite than a grave suspicion as to the nature of the swelling. Fearing an operation, she did not call upon me again for three months, when a remarkable change had occurred. The growth had increased with great rapidity, considerably more than doubling its size, and the diagnosis had now made itself.

The breast was removed in the ordinary way. The large skin flaps were thin, and full of dilated veins. The edges of the wound were brought

together with catgut sutures. The catgut ligatures were left long and hanging out of the lower corner of the wound, and the wound dressed with ordinary antiseptic precautions, gauze, and wound-wool pads. At the end of a week, as some discharge had stained the outside dressings, the first dressing was removed. A small portion of one of the flaps, about the size of a penny piece, had sloughed; and this, together with the fact that the bandage had become loosened, and the parts were very vascular from dilated veins, occasioned this trouble. A little iodoform was sprinkled on the slough, and a dressing similar to the first re-applied. In a fortnight the second dressing was removed. The granulating surface left by the slough, which alone remained unhealed, was dressed with ointment. On the sixth day the patient got out of bed; her temperature never reached 100°, and, except for the changing of the dressing, her recovery was uninterrupted.*

I have now done over forty excisions of the breast, in many cases removing at the same time the axillary glands. The majority of these have healed under one dressing, as I have been endeavouring to arrive at this result for the past ten years. Of the last fifteen cases this is the only failure, so that I am in a position to say, with some confidence, that however extensive a wound may be left, after breast operation, no more drainage is necessary than that afforded by a few catgut threads, and that the wound and patient need never be disturbed after a dressing properly applied at the time of the operation.

Case 2.—An example of ordinary scirrhus of the breast and axillary gland from a patient 50 years of age.

The interest of this case depends on there being two forms of growth in the breast. Seven years ago the patient consulted me with a large fibroid tumour in her uterus, and a similar small tumour in the right breast. I advised her, considering her age, to have nothing done to either, and that her prospects, without operation, were good. Last month she again consulted me, and reminded me of our former interview. In addition to this old fibroid nodule in the breast there was now scirrhus growth of a year's duration, which unfortunately involved the axillary glands as well. The whole disease was removed by my brother, and the wound healed in three weeks with one dressing, except the granulating surface which usually remains at the lower end of the wound.

INTRAPERITONEAL RUPTURE OF BLADDER FROM RETENTION OF URINE.

For leave to publish the case I am indebted to Dr. Hume, in whose absence the patient came under my charge, and for most of the particulars I am obliged to Dr. Parry, House Surgeon of the Newcastle-on-Tyne Royal Infirmary.

W. McN., age 25, was admitted to the Infirmary on 20th December,

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* *My brother, Mr. A. E. Morison, who had this case under his care, says*: "*The growth was examined microscopically, and proved to be cancer. Mrs. T. died in* 1900, *of phthisis pulmonalis. There was no recurrence of the breast growth.*"

1888, about four o'clock. The patient stated that he was suffering from 'stone in the bladder,' and was very ill because he could pass no water.

The history of his illness was that for a month he had had difficulty in micturition, which he thought was caused by an ordinary gonorrhœa. A fortnight before admission he became the subject of a 'chordee,' which caused complete retention of urine for some twelve hours. Finally this subsided, and he was able to pass his water, not freely, but with difficulty, as it only came away in small quantities with great pain and frequency. This state of affairs lasted until four days before admission, when complete retention occurred, and he had passed no urine since.

Later enquiry discovered the fact that he had lain in bed with a whisky bottle, and had consumed several.

During this time he suffered great pain, and had constant desire to micturate, except on the last two days. On the second or third day of this retention, he cannot definitely remember which, whilst vainly endeavouring to pass water he felt "something give way," and was immediately seized by a burning pain, which spread all over his belly and "flew to his heart." He vomited at once, and felt very weak, though relieved of the frequent desire to micturate. The vomiting continued till his admission, and he could get no sleep for the pain and swelling in his belly. During the retention several attempts had been made to give him relief by catheterization, but without success. He had had no injury during his illness.

On Admission.—Patient collapsed; drawn, anxious countenance; small, thready, frequent pulse; frequent shallow respirations; temperature normal. Since coming in he had vomited some coffee-ground fluid. On passing a black No. 8 French catheter, the bladder was apparently easily entered, and about 3 ozs. of urine, slightly smoky, was drawn off. After the withdrawal of the instrument a small quantity of sanious pus escaped from the urethra, and some was found in the eye of the catheter.

On examination of the abdomen, it was found to be tense, swollen, and tender—tympanitic all over, except in the flanks and lower parts. The dullness varied according to the position of the patient, and there was fluctuation from side to side.

Intraperitoneal rupture of the bladder was diagnosed, and the patient chloroformed with the intention of completing the diagnosis, and discovering and (if possible) suturing the wound in the viscus, which was thought to be small.

Operation.—A No. 14 French silver catheter was introduced into the bladder, and three pints of a warm boracic solution pumped carefully, and without meeting with any resistance, through it. The dullness in the flanks was found to increase in direct proportion to the amount pumped through the catheter. On removing the plug from the catheter, only half a pint of lotion returned, 2½ pints being retained. The catheter could not be passed through the opening in the bladder.

A median abdominal incision was now made below umbilicus, about four inches long. The peritoneum was distended with fluid, which escaped on opening it to the extent of about three quarts. The intestines were held back by a flat sponge, and a small round opening, scarcely so large as a split pea, and of grey ashy colour, was found at the superior portion of the posterior wall of the bladder. This was closed by two interrupted sutures of fine silk introduced after Lembert's method, and the peritoneal covering of the bladder was brought over to cover these by a continuous suture of fine catgut. The abdominal cavity was well washed with warm boracic lotion, and carefully dried with sponges.

A second quantity of boracic solution was now injected into the bladder, which was distended by about two pints, and found to be watertight. The abdominal wound was sutured, a drainage tube introduced, and the patient put to bed better than when the operation was commenced. (As soon as the abdominal tension was relieved by incision of peritoneum, ether was given instead of chloroform.)

After-progress.—Two hours after the operation he was very well, and felt as if he wanted to pass water. This he was not allowed to do but by a soft catheter: 16 oz. were drawn off. Two hours later 12 oz. were similarly removed, then every two hours after, 6 oz., 4 oz., 2 oz., 3 oz., 2½ oz., 0, 2 oz., 1 oz. The first urine drawn off was slightly tinged with blood. All the rest normal.

During the first twenty-four hours he perspired profusely, and his pulse gained in tone. He complained of thirst, which was relieved by small quantities of soda water, potass and brandy, soda and milk, which the patient retained. He was restless and a difficult man to manage. There was no pain, tenderness, or tympanites, and his chances now seemed very good.

Dec. 27, 11 a.m.—Dressed. Abdomen aspirated through tube with syringe. About ʒj of bloody serum, free from odour, removed. On the afternoon of to-day, the patient's bowels were moved copiously twice. The motion was very liquid and of the same coffee-ground character as the previous vomit. Evening: Pulse very frequent (120) and thready, temp. 97·6°, and not so good as in the morning, though not worse than when he was admitted. He vomited once some coffee-ground fluid.

Dec. 28.—Pulse weak and rapid; not recovered from collapse of last night. One pint of milk, one egg, one wineglass of brandy every four hours, and allowed drinks of tea, and soda and milk for thirst. Enemas of half-pint of beef tea with tr. opii. when required. The abdomen was flat and free from tenderness or pain. He retained all his nourishment. Diarrhœa of some coffee-ground fluid came on in the afternoon of to-day, and became so excessive that starch and opium enema was administered. Pil. opii. did nothing to check it. For a time after starch and opium, it was relieved, but returned, and continued till his death at 2.30 o'clock, on the morning of December 29, 1888.

The catheter was only used once (when his bladder was found to be empty) during the last twenty-four hours, as he passed water himself when using the bed-pan. The patient apparently died from collapse ending in syncope.

Dr. Drummond's post-mortem report: Body somewhat emaciated. Rigor mortis present. A wound 4½ inches long in the mid-line of abdomen, closed by wire and catgut sutures. The edges were united in places. No suppuration about the wound.

On opening the abdomen, the small intestine was injected here and there, and in places coils were adherent by lymph. The hole, which indicated the situation in which the drainage tube lay, was surrounded by lymph and intestine. On injecting the bladder and distending it, the line of suture was brought into view, and the bladder found to be water-tight. A little lymph was found in the bottom of the pelvis, but no fluid. The intestines were opened from the stomach downwards.

Stomach.—Mucous membrane injected in parts, and covered with mucus. One or two circular ulcers were found.

Intestines in a similar condition to stomach. There was also evidence of enteritis. Bladder, prostate, and urethra were removed.

Bladder.—Inner surface of bladder of a purple colour, much injected. Corresponding with the suture, was found internally a circular ulcer, which was rendered obvious by the perforation.

Prostate enlarged ; in size equal to a walnut. There was also an abscess in the right lobe.

Urethra presented nothing worthy of importance.*

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* *The gastro-intestinal condition which caused his death is similar to that produced by the fatal injection of urine into the peritoneal cavity of animals.*

1890

CASE OF POPLITEAL ANEURYSM.

(*Northumberland and Durham Medical Society's Transactions*, October, 1890.)

Mr. Morison showed, for Dr. Fielden, of Shildon, a case of popliteal aneurysm. The case presented all the ordinary classical signs of spontaneous popliteal aneurysm. The only point peculiar about the case was that the swelling had followed an injury by a piece of stone which struck the leg behind the knee. It was questionable whether this was the cause.* As to treatment, Mr. Morison expressed a strong opinion in favour of immediate ligature of the femoral in Scarpa's triangle.

1891

FRACTURED FOREARM BETWEEN PRONATORS AND SUPINATORS.

(*Northumberland and Durham Medical Society Transactions*, January Meeting.)

Mr. Rutherford Morison showed the bones of a forearm with the muscular attachments dissected out.

The specimen demonstrated the deformity that follows a fracture of the radius above the centre.

A united oblique fracture could be seen running from above downwards and from without inwards between the insertions of the supinator brevis and pronator radii teres. The lower fragment had united in a position of extreme pronation and the upper was markedly supinated. This was explained by the unopposed action of the biceps and supinator brevis on the upper fragment, and the pronator radii teres and pronator quadratus on the lower.

Mr. Morison had seen three cases during life, and in all there was loss of power of pronation and supination in the arm.

He advocated wiring the two ends, with strict antiseptic precautions.

**I do not now think it was questionable, but that injury was the cause.*

1892

PATIENTS OPERATED ON FOR CANCER OF BREAST.

(*Northumberland and Durham Medical Society's Transactions*, February, 1892.)

This patient, age 53, was operated on by me for cancer of the breast in June of last year. At that time only the breast was removed, along with the pectoral fascia, for, as has been my custom, I do not remove the axillary contents unless there is evidence of disease there.

She returned in January of this year with a malignant nodule on her chest, at a point midway between the ensiform cartilage and axilla, and evident disease in the axillary glands. You will observe the very long—about a foot—recent scar running directly downwards from the coracoid process. The operation was done ten days ago, and the immense wound healed by first intention, without drainage and without constitutional disturbance.

A portion of skin, 3 or 4 in. long and 1½ in. broad, was taken away in the centre of the incision, with a nodular growth to which it was attached, and the skin on either side was reflected. The whole chain of diseased glands along the lower border of the pectoralis minor, with a large piece of pectoralis major, to which they were adherent, was removed, and the axilla freely exposed by division of the pectoralis major and minor over its centre. The axillary contents were carefully dissected out in one piece, leaving only the blood-vessels and nerves at the completion of the operation.

The case cannot be described as one of recurrent carcinoma, for the original tumour was not of rapid growth, and there can be little doubt that, though nothing was discovered until six weeks ago, the parts recently removed were diseased at the time of the first operation.

My object in bringing this case forward is to raise the point for discussion as to what is the proper operation for breast cancer; whether in every case the axillary contents should be cleared out, and how far radical operations for the cure of breast cancer are to go. I am a strong advocate for radical operations in malignant disease, and would give a wide berth to evident malignant growths, but it seems to me unreasonable to attack structures not visibly or palpably diseased. This case may be taken as an argument in favour of a radical operation, but the most radical operation advocated would not have delivered her of the largest growth on the side of the chest. It is much too low to have been reached by any ordinary operation.

Experience is after all the only thing to settle a question of this sort, and I can at present recall three cases, whose subsequent histories I know, in which I excised the breast only for cancer.

Case 1.—Died of cancer of the liver two years after operation, without any disease elsewhere, in scar, or axillary glands, as verified by post-mortem.

Case 2.—A patient of Dr. Morgan, of Sunderland, where she died, had the breast excised by me for cancer eight years before. Dr. Morgan and I

agreed that death was caused by cancer of the stomach. There was no recurrence locally or in axillary glands.

Case 3.—Breast excised for scirrhus six years ago. Patient still alive, and without any disease.

In America these patients would have had their breasts and the skin covering them removed, the pectoralis major entirely taken away, and the axillary contents dissected out. They got off more easily with me, and lost nothing by it, for the disease did not recur in any of the structures that would have been sacrificed. My experience would lead me to believe that if the axillary contents are cleanly removed, that the prognosis for cases of excision of the breast and axillary glands for scirrhus is more hopeful than one is usually led to suspect. I have in mind two cases in which I performed this operation more than five years ago, both patients being well and free from recurrence.

A REMARKABLE RECOVERY AFTER AN ACCIDENT.

Twenty-seven years ago, when 15 years of age, this patient fell forty fathoms into a mine, and received a fracture of both thighs and the left leg, also the right elbow and shoulder and jaw-bone. He was confined to bed for eleven months. The doctor who first saw him after the accident said it was no use doing anything, as he could not live. Between four and five years after he went to Truro Infirmary, where Dr. Sharpe cut down on the ends of one of the ununited femurs, sawed them off, and pegged them together with silver wire. The operation was not a success, and both femurs are still ununited. In spite of this, he is able to stand thirteen hours a day at his business with a small and almost useless leather support ; but without anything at all in the way of support he can walk fairly well.

The case is remarkable enough up to this point, but its most striking feature has still to be related. You will observe under his chin a large cicatrix. The story is that, when found, his nose and mouth were buried in mud, and he was breathing through a large opening which left this scar.

A NEW MEDICAL JOURNAL.

(*Northumberland and Durham Medical Society's Transactions*, March, 1892.)

Mr. Rutherford Morison brought forward a suggestion that the Transactions of the Society be incorporated with a new monthly journal, to be called the *Northumberland and Durham Medical Journal.*

The chief arguments in favour of this were :

1. There is no medical centre of the size and importance of Newcastle without a medical paper of its own.

2. The transactions of the Society are becoming increasingly difficult to make up, for papers are crowded out by the exhibition of patients and specimens which the Society cannot discourage, regarding this as its most important and useful function.

3. For seven months in the year there is no record of the local work being done, and everyone spoken to on the subject thought the paper should be a success.

Mr. Morison said it was not his object in bringing forward the suggestion to ask the Society to settle anything definitely at once. His idea was that the paper might also include the Clinical Society's Transactions, and be available for others than members of either Society; but the only way he knew of bringing the matter to a practical issue, was to take the action he had in bringing the subject before them. If the meeting decided in favour of the scheme, he proposed, in conjunction with Dr. Limont, to bring a plan for carrying it out before the next Annual Meeting, when the whole subject would be ripe for discussion and arrangement.*

SURGICAL IMPRESSIONS OF AMERICAN HOSPITALS.

(*Edinburgh Medical Journal*, March, 1892.)

Having recently spent eighteen days in America, visited seven hospitals, and seen several surgeons, I think the relation of some of my experiences may interest certain readers of the *Edinburgh Medical Journal.*

In crossing the Atlantic I was fortunate in meeting Dr. Draper, Physician to Roosvelt Hospital, New York, and Dr. Kelly, Gynæcologist to the Johns Hopkins Hospital at Baltimore, who were returning after a holiday in Europe. Armed with introductions from these gentlemen, I was enabled in a short time to see a good deal of surgical work, and met with a very agreeable reception. An introduction is, however, not essential. The American surgeon is a good fellow, and it will be a Britisher's own fault if he cannot get along with him.

I arrived too late to attend the Washington Medical Congress, where the attendance of several distinguished British surgeons (Professor Chiene among them) at the meetings was much appreciated.

The first hospital I visited was the Roosvelt, in New York, with about 250 beds. This hospital is an excellent one, but cramped for ground space, and not built in accordance with the latest views on hospital construction. It will soon, however (for the building is nearly completed) be possessed of the finest operating theatre in the world, erected at a cost of £80,000. The sum was left by a wealthy benefactor, with the express stipulation that the whole of it should be expended on this object. The area is to be wholly marble, and the difficulty of disposing of so much money is being met satisfactorily by making it quite an extensive building. There are to be isolated ward-rooms at the top; the operation-room porter and nurse are to have quarters there. Photographic, bacteriological, and pathological rooms are to be provided; and a number of special rooms are to be set apart for instrument sterilizing, and disinfecting apparatus, dress-

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* *This Journal is established.*

ings and the special appliances for preparing them, and consulting and other rooms for the staff.

In the hospital, among several interesting cases, I noticed a boy who had recovered after an operation for perforating ulcer of the vermiform appendix with general peritonitis. The abdomen had been opened and cleansed, and the vermiform appendix removed by Dr. Hartley. This was the only case known to have recovered after such a lesion, in New York. Another youth was recovering after an operation for intestinal obstruction due to a band and adhesions; and the interesting feature in his case was that a year before he had been laparotomized for tuberculous peritonitis.

Dr. M'Burney had several cases on which he had performed an operation of his own for the radical cure of hernia. He ligatures the sac at its neck, removes it, slits up the whole length of the canal and the skin covering it, sutures the upper skin margin to the conjoined tendon, the lower to Poupart's ligament, draws the inverted skin margins towards each other by deep sutures, and packs the resulting ditch with dressing, from the bottom, till the wound is healed. The object is to secure a firm fibrous barrier against the descent of another hernia. The large gash, held by button sutures, looks formidable, but the results are said to be excellent; and I had the opportunity of examining a young man who turned up three months after operation, meanwhile having been at work, and in him the site of operation appeared to be much the strongest and most resistant part of a strong abdominal wall.

The genito-urinary cases are kept in a separate ward, and have male attendants. A considerable number of buboes were under treatment during my visit; and, judging by what I saw, I think it would be fair to assume that bubo in America must be a much more serious disease than with us. It is the rule to dissect out all the infected glands, and to remove all infiltrated skin. The result necessarily is, in some cases, a huge granulating surface in the groin. One man I saw had had the misfortune to have the glands and skin on both sides affected, and when seen by me had a granulating area on each side quite the size of my outspread hand. The same treatment was adopted in Vienna when I was a student there in 1878.

There were several cases of urethral stricture under treatment, and I was surprised to learn that all strictures are dealt with by internal urethrotomy. Those in the penile portion are cut only; those behind are cut, and in addition the bladder is drained through the perinæum. Dr. M'Burney has invented an ingenious instrument for making a small perineal opening just large enough to admit a drainage-tube, instead of the larger incision necessary when the bladder is drained in the ordinary way.

The bougies used in the after-treatment are terrible-looking weapons, and 'bougie day' did not appear to be anticipated by the patients with feelings of unmixed satisfaction. Surgical principles are not elastic enough to allow of such a radical difference of opinion and practice as I saw there and see with us. If they are right, we are wrong.

I had the opportunity of examining some cases recovered after operations for the removal of malignant growths. The operative treatment adopted is much more radical than is the rule with us,—e.g., in an ordinary case of scirrhus of the mamma it is usual to remove a large area of skin covering and surrounding the growth, to take away the pectoralis major, divide the pectoralis minor, and dissect out from the axilla everything except vessels and nerves. The skin gap is filled up by a Thiersch's graft,—an excellent method, not sufficiently used here. I had the opportunity of seeing that the usefulness of the arm was but little impaired by the loss of the pectoralis major.

In cancer of the tongue an incision is made through the centre of the lower lip, down through the middle line of the chin and neck to the hyoid bone. A second incision crosses this, running along the lower edge of the body of the jaw from one facial artery to the opposite. The flaps so marked out under the chin are reflected, the glands dissected out, and the lingual arteries tied. The lower jaw is now sawn through in the middle line, and the floor of the mouth and tongue removed. In one case, I think a patient of Dr. Halsted's, of Baltimore, the upper part of the larynx and a considerable portion of pharynx had been removed in addition, and a year after the patient was in excellent condition and free from recurrence.

In all operations the most strict aseptic and antiseptic precautions were used. Here, as in all other hospitals I visited, the operator, his assistants, and the operation-room nurse, all wore special clothing; but I will enter more fully into detail on this point later in connection with the Johns Hopkins Hospital at Baltimore.

Ether was the invariable anæsthetic. It was administered on a simple stiff cone covered by a towel. At Boston it was given on a large, thick, cone-shaped sponge, without accessories of any sort—a safe, efficacious, cleanly, and simple method. Chloroform is mostly regarded as unsafe, and ether is in general use.

The catgut for ligatures was prepared here in a simple way. It looked well, and was said to be satisfactory when tested clinically and bacteriologically. The gut, bought dry and unprepared, was first put into ether from two to four hours, depending upon its thickness, then into 1–1000 corrosive lotion for the same time, and from this into alcohol, where it was permanently kept till required for use. All instruments were sterilized before use in a special hot-air or steam sterilizer.

Hagedorn's needle and needle-holder were used for the introduction of sutures, and a needle-holder had two arguments in its favour—first, convenience; and, second, it was more readily and surely sterilized than fingers. A large number of sutures were used in wounds. Tier upon tier of catgut sutures held the deeper structures in apposition until the sides of the wound were so closely opposed that there was no space for and no need of drainage. Cheap sponges, made use of only once, were employed during operation. The dressings were gutta-percha protective dipped in weak corrosive lotion, and torn into small patches, next the wound, and either sterilized gauze and wool, or corrosive gauze and wool heaped outside of this and retained by an ordinary roller bandage.

Bellevue. — Bellevue is an old-fashioned large hospital (800 beds), with a medical school in its grounds. There I saw a laparotomy performed by Dr. Polk, gynæcologist to the hospital. The operating theatre is a very large one, much resembling the theatre of the old Edinburgh Infirmary in its arrangements and appearance. From 150 to 200 students were present, and waited comparatively quietly for Dr. Polk and the patient.

On Dr. Polk's arrival he was greeted with enthusiastic cheers, for he had just returned from a holiday in Europe. The patient was immediately wheeled in on a couch, under the influence of ether, and her case briefly discussed. She was then stripped and placed on a low, short operating table, only long enough to hold her body. The legs rested on a stool. The operator explained that he had brought her unprepared to show the methods adopted preliminary to operating, and an assistant proceeded to smear the abdomen with an alcoholic solution of soap, and with the vigorous use of a nail-brush and hot water soon produced an abundant lather. The pubis was now shaved with a razor and the lather washed off by pouring a hot solution of corrosive sublimate from a jug over the abdomen. Whilst the abdomen was being attended to by one assistant, a second was cleansing the vulvar orifice and interior of the vagina by directing the flow of lotion over and into these parts by his hand and fingers. The cleansing process finished, the patient was entirely covered by antiseptic moist towels, excepting a portion of the abdominal wall of parallelogram shape, reaching from the umbilicus to the pubis. Dr. Polk and his assistants, having thoroughly washed and disinfected, got into their respective places. The former seated himself at the lower end of the table, between the thighs of the patient, with a leg on either side of him, and his abdomen resting against the patients' perineum. This, he said, was Martin's (Berlin) position, and had many advantages. An assistant stood on each side of the patient ready to help the operator. A variety of matters were discussed and

explained during the proceedings, and an occasional halt made when any particular point required emphasizing. The operator, taking a long-bladed bistoury, and commencing the incision just below the umbilicus, with one skilful sweep cut through all the structures at once, down to either fascia transversalis or peritoneum, for the next step was to seize the tissues at the bottom of the wound on either side with two pairs of artery forceps, between which a nick was made, opening the peritoneum. The finger was now introduced and the peritoneum slit up the length of the wound. The uterus and appendages were then drawn forward, the extent of disease, a double hydrosalpinx, ascertained, and the operation completed by the removal of the diseased appendages in the most approved fashion.

I have not yet shaken off a feeling of being in sacred ground when my hand is in the peritoneal cavity, and it was somewhat startling to me to see the unceremonious way in which this operation was performed at Bellevue. The impression conveyed to my mind was that the operation was as exciting to the operator as the operation of trimming the nails is to an ordinary mortal, who is occupied in conversation whilst doing it, and does not feel the least need of hurrying over the performance.

I have never seen an operation more skilfully performed; but the advantages of the position adopted would have to be very clear before a British surgeon could be persuaded to adopt it. It is not an elegant one.

The New York City Hospital.—This is a very handsome building, outside and in. It is built on the pavilion principle, and each individual ward is a model of what a perfect hospital ward should be. Unfortunately it has been built on a limited space, and is five storeys high, with a very limited interval between each block. The consequence is that the natural lighting and ventilation of the lower wards especially is considerably interfered with.

Dr. Weir, one of the surgeons to the hospital, kindly conducted me round, and I had the opportunity, after the visit, of seeing Dr. L. A. Stimson excise the vermiform appendix for perforating ulcer and peritonitis. The patient was a young man of about 18, who, six months before, had an attack of perityphilitis, from which he recovered under medical treatment. He was now suffering from a relapse, with urgent symptoms, and though his abdomen was much swollen and tender, a large resisting mass could be felt in his right iliac fossa. An incision about six inches long was made in the right linea semilunaris, and a quantity of fœtid pus welled up as soon as the peritoneum was opened. On further opening the peritoneum it was seen that the pus was well localized and shut in by adherent coils of intestine, with the exception of a small place at the upper part, where a communication

tion might possibly exist with the general peritoneal cavity. The pus was very carefully sponged out with small sponges in long forceps, wrung out of 1–1000 corrosive lotion, particular care being taken not to disturb any of the adhesions towards the cavity of the abdomen. The vermiform appendix was then seen projecting from the end of the cæcum into the cavity, like a thick reddened spur, and after tying and dividing its mesentery it was ligatured at its base and removed close to the cæcum. The exposed interior of the divided appendix was then touched with pure carbolic acid, and afterwards seared with the point of a thermo-cautery. When all blood and pus had been cleared away by sponging, the pus cavity was gently packed with strips of iodoform gauze all round the stump of the appendix. The wound was sutured and the ends of the gauze strips left projecting through a small gap, to be taken away later, when further adhesion had made it safe to do so.

To see this operation was a great treat. The consummate skill with which it was performed, the careful attention to every detail in the performance, and the scientific way in which possible accidents were provided for, ensured success, if success were possible.

The appendix was opened in my presence, and there was, near the end, an ulcer about the size of a threepenny bit, which had perforated near its centre at one very minute point.

During my visit I saw at least five cases in which the appendix had been removed for similar conditions. The only deduction I can make is that appendicitis is more common in America than in Europe.

When discussing the condition with Dr. Hartley, surgeon to Bellevue Hospital, I mentioned that in three cases, at least, I had opened a perityphlitic abscess with good result, immediate and remote, so far as I knew. He said the appendix was always removed in America in such conditions when it was possible to find it, as, if it was not, relapse was not infrequent. In proof of his statement he showed me a boy whose appendix had been removed a few days before, and his history was that a few months ago an abscess had been opened after a severe illness, and healed; he got quite well, had a relapse, and had now been admitted a second time with recurrence of similar symptoms, and had his diseased appendix excised.

The Johns Hopkins Hospital at Baltimore, on its completion, will be the most perfect large hospital in the world. It will be double its present size, and will then have 400 beds. Possibly this statement may give the impression that it appears unfinished at present. This is not the case. Everything, so far as it goes, is complete, and everything that medical or surgical brain could wish for and think of is there. The appointments on the staff are the best in all America, for they secure to their fortunate possessors an income of £1000 a year,

with no restrictions whatever. Could any conditions be better calculated to secure for the citizens of Baltimore the best medical services ?

Dr. Hurd, superintendent of the hospital, showed me round. He had the whole working of the hospital at his finger ends, and appeared to know all that was going on equally well in every department—medical, surgical, gynæcological, pathological, and bacteriological. He knew every instrument, recent and late, and could explain its advantages and disadvantages ; every dressing, new and old, he had considered, and what things were necessary, good, and indifferent in the hospital he was clear in pointing out.

The out-patient department was the most perfect working arrangement I have seen. No time was lost, and with very little trouble a good record of each case was kept.

There is a good opportunity at Baltimore, as at Liverpool, of comparing the circular ward (or more correctly at Baltimore, octagonal) with pavilion wards, as each hospital has wards on both systems. I could get no expression of opinion at either Baltimore or Liverpool as to which was considered best, except that Dr. Hurd told me that patients preferred the circular, as feeling more private, from the central pillar hiding one-third of the ward from the remaining two-thirds, and that nurses liked the ordinary ward best for the opposite reason—that they could see all that was going on in the ward from any one part of it.

My own feeling—after seeing Antwerp Circular Hospital, Johns Hopkins, and Liverpool—is in favour of the circular ward. After the first strange appearance has worn off, it is not difficult to see that on a limited ground space ventilation can be more efficiently secured, and aspect, of such prime importance in pavilion wards, where those with a northern frontage always appear colder and darker, may in the circular be almost neglected.

The private wards at Johns Hopkins Hospital are so well patronised that last year they produced an income of £8000 for the hospital.

Nearly all the public hospitals in America have private apartments attached for paying patients, who are taken in at fees ranging from £2 to £10 a week ; and private hospitals are much more common than with us, as it is fully recognized that a patient's chance of recovery, especially in surgical cases, is much better in a properly equipped institution than at home.

The pathological and bacteriological laboratories form a part of the building ; and though this arrangement was made temporarily, it has been found to work so satisfactorily that it is now agreed that they shall remain permanently.

After going round the hospital with Dr. Hurd, I accompanied

Dr. Halsted through the surgical wards. There was a dearth of interesting cases, but what I did see was novel and good.

Dr. Halsted has written on the "Treatment of Wounds, with especial reference to the Value of Blood-Clot in the management of Dead Spaces," and showed me an interesting case bearing on this. A middle-aged man had necrosis of the lower end of the femur, for which he had already undergone three unsuccessful operations in good hospitals during an illness extending over twenty-five years. Dr. Halsted dissected away all sinuses, and thoroughly scraped out a large cavity in the lower end of the femur. Taking the view that this large cavity could not heal, he cut down on the anterior part of the femur, and removed an elongated portion of the middle of the bone, opening up the cavity from the front. He transplanted into the hole a flap of the vastus internus muscle, and this, together with blood-clot, filled the cavity completely. An aseptic dressing completed the proceeding; and at my visit, a few weeks afterwards, the leg was healed without a trace of suppuration.

I saw also a novel method for the radical cure of hernia, which was said to be giving excellent results. Dr. Halsted's operation is based on the opinion that the presence of the spermatic cord in the inguinal canal is an important factor in the causation of hernia, and the prevention of a radical cure. He consequently makes a new passage for the spermatic cord in the abdominal wall higher up than the internal ring. The incision begins at the anterior superior iliac spine, and ends internal to the inner pillar of the external abdominal ring; dividing skin, external oblique aponeurosis, internal oblique, the part of transversalis muscle exposed, and transversalis fascia, the whole length of the skin incision. The spermatic cord is then separated to the upper level of the internal ring. The sac is isolated and drawn forward with the exposed peritoneum through the wound. The opposed peritoneal surfaces are then brought together along the line of incision by a series of quilted sutures, and the redundant peritoneum and sac clipped away close to the line of sutures. The cord is now brought through between the muscles near the upper end of the wound, and the divided muscles are brought into apposition by a second row of quilted sutures. The aponeurosis of the external oblique may be included in this or separately sutured. Finally, the skin wound is carefully sutured, leaving the spermatic cord between skin and aponeurosis. No drainage tube is required.

I next went to Dr. Howard A. Kelly's Gynæcological Clinic, one of the most interesting medical sights in America. Dr. Kelly is a young man, only thirty-five, and has attained his present position solely by his own work and ability, which count, I fancy, more in the New than in the Old Country. His results in abdominal operations

can scarcely be surpassed, and I was much impressed by the thoroughness of all his work. He has a special theatre and wards of his own, and has described those and his method of working in full in the Johns Hopkins Hospital Reports for 1890. The combination of asepsis and antisepsis described is such as is employed at most of the surgical clinics with a strictness not frequently to be seen in this country, and I have purposely left distinct mention of this important subject till I could do it full justice.

The following extracts from Dr. Kelly's report show where and how his surgical work is carried on: "The gynæcological operating-room of the Johns Hopkins Hospital is in a separate building, in the centre of the private gynæcological ward. Clustered around it are thirteen private bedrooms for patients. Bathroom, water-closets, and sink are all located in the remote part of the wing, projecting from the main building. The operating-room faces the west, and is lighted by three long windows. Its floor is 16 by 20 feet, and the height of the walls 14 feet. The walls have a hard soapstone finish, allowing the free use of water in cleansing, and by their light colour diffusing the sunlight which enters the three western windows. All angles and corners in the whole building are rounded off, preventing accumulation of dirt, and greatly facilitating the cleansing. The floor is laid with light-coloured, hard, encaustic German tile, closely fitted, absolutely impervious to water and blood. It slopes to the discharge-pipe beneath the wash-basin, which carries off the water used in mopping after operations. The hot and cold water used for the preliminary washing of hands and instruments is supplied by five pairs of faucets—four over four porcelain hand-basins set in a marble slab, and two large faucets over a porcelain-lined sink, 24 by 48 inches, used for washing instruments and glassware. All pipes are open to view. There are no concealed nooks or corners in any part of the room. There is absolutely no 'dead space.' All of the water is either distilled or filtered. The tap-water has already been filtered in the boiler vault by a Loomis's filter, and yields from the cold faucet but 5 to 6 colonies of nonpathogenic bacteria to the cubic centimetre, in place of 35 in the non-filtered water. The hot water thus tapped is sterile (Dr. Abbott's report).

"*Treatment of Instruments.*—Instruments are immersed in distilled water during an operation, and are never allowed to become dry afterwards until thoroughly cleaned. After an operation they are at once washed with hot water and brown soap from two to three times, and then dried very carefully and put away in the case. Immediately before using the instruments at an operation, they are sterilized by steam in a newly-devised Rohrbech oven at 100° C. (212° F.) for a half hour, when by turning a ventilator the steam is shut off, and they

are automatically dried before being removed from the oven. From the oven they are at once transferred to the glass trays and basins, in which they lie throughout the operation, immersed in hot distilled water.

"*The Patient.*—The patient is prepared for an abdominal operation by daily baths for three or four days, or a longer period if the opportunity is afforded, and the condition of the skin requires it; in the bath the nurse carefully scrubs the skin of the abdomen, thoroughly cleaning out the umbilicus. In addition to this the patient receives twice daily a vaginal douche of 1–3000 bichloride of mercury, or a 3 per cent solution of carbolic acid. For abdominal hysterectomy the technique of vaginal cleanliness, in washing out with soap and water and douching frequently, is more aggressive and thorough. The bowels are always freely opened, and the diet limited to soft, easily-digested food for from three days to a week beforehand. An hour before the operation she receives one-fourth of a grain of morphia and 30 grs. of bismuth. When lifted on to the operating-table, the abdomen is again thoroughly cleansed with soap and hot water, and the genital hairs shaved off. This is followed by a douching with bichloride (1–1000), and again with water to remove the bichloride. The field is then aseptic and ready for operation.

"The *gauze, towels, sponges, and ligatures* used in all operations are disinfected as follows: The gauze is common cheese cloth, a yard wide, costing 5 cents per yard. It is first cut in lengths of three yards, then boiled in a solution of washing soda, 2 drachms to the gallon, for twenty minutes; after this it is thoroughly cleansed by washing in four distinct hot distilled waters. Then it is wrung out and laid in a bichloride of mercury solution (1–500) for one hour, and after this transferred to alcohol, or to a 3 per cent carbolic solution for preservation. Just before use it is lifted out of a large salt-mouth jar, and wrung out and laid in distilled water. The towels are soaked for twenty-four hours in 1–1000 bichloride solution, and then wrung out and put in a large jar of 3 per cent carbolic solution. The sponges are bought by the pound, costing from 1 to 2 cents a-piece. They are brown and gritty in the package, requiring much careful handling to render them safe for use. They are first laid in a dry cloth, and pounded lightly to break up and loosen and remove the coarser grit. They are next immersed in a solution of hydrochloric acid (commercial), one drachm to one pint, and left twenty-four hours. They are taken from this and washed in from twelve to sixteen hot waters, until they no longer give the water a yellowish colour; they are carefully handled all this time to separate all lumps and spiculæ which can be detected by eyes or fingers. They are next transferred to a 1–1000 bichloride solution for twelve hours, and from this transferred to a 3 per cent watery solution of carbolic acid for preservation.

" The *Ligatures and Sutures* are of twisted surgeon's silk, bought in skeins, sizes 1–4. They are freshly prepared every week. The skeins are opened and laid in boiling water for twenty minutes. They are next immersed in a 1–3000 bichloride solution for three hours, and transferred to alcohol for preservation on long spools. Just before the operation the cover of the dish is removed and the necessary amount of ligature pulled out and cut off. Any ligatures left over after a laparotomy are transferred to another glass dish, and used for perineal and vaginal operations.

" *Catgut* is bought raw from the instrument maker, and prepared as follows : It is first immersed in a watery bichloride solution (1–1000) for twenty minutes, and then transferred to absolute alcohol for one hour. It is then laid in oil of juniper wood for forty-eight hours, and transferred back to alcohol for preservation. I do not feel safe in using strands of catgut of more than 1 mm. in thickness.

" *Silk-worm gut* is bought in bunches, the curly ends are cut off, and the straight pieces laid in absolute alcohol for preservation.

" *Operator and Assistants.*—The toilet of all persons in the room is one of the most important features. Visitors are required to put on large linen wrappers completely covering their street clothes. Nurses wear clean washed dresses on their costumes. Operator and assistants remove coat, vest, starched shirt, trousers, and shoes, donning a freshly washed white linen suit, with short sleeves, and white canvas shoes with rubber soles. They are thus dressed in clean white clothing from head to feet. Before touching instruments, ligatures, etc., the operator and his assistants, upon entering the room in their white suits, turn to the wash-basins, and there spend *at least* ten minutes washing hands, finger nails, and forearms with brown (oleine) soap and warm water and a moderately stiff scrubbing brush. The thorough use of a good brush on short nails will do all that is necessary. After washing thoroughly in soap and water, the hands are next immersed in a saturated solution of permanganate of potash, and held there until they are uniformly deeply stained, from which they are transferred to a saturated solution of oxalic acid, which removes the stain in one minute. They are then dipped in plain water, and finally laid in a bath of perchloride of mercury (1–1000) for a measured minute. The hands and arms are thus rendered clean and aseptic. It will often happen that it is necessary after this preparation to touch parts of the patient which are not aseptic, as in arranging her conveniently on the table, or various articles not assuredly aseptic may be handled by accident or otherwise. After such contamination, a brief, but careful scrubbing with the soap and water, followed by a brief plunge into the bichloride solution, will render the hands once more aseptic. *I attach the utmost importance to the thoroughness of the first washing*; if this is

efficient, the dirt of twenty-four hours is removed, and any subsequent superficial contamination may readily be removed with less pains.

" *The Operation.*—With such preliminary antiseptic preparations, the operation is begun under aseptic conditions. *Throughout the operation no antiseptic solutions are used.* If the intestines need washing or the abdomen douching out, distilled water at 110° F. is used. For sponges, instruments, ligatures, or cleansing the hands from time to time, nothing but boiled distilled water is used.

" *The Field of Operation* is next shut off from the rest of the body, the table, etc., in the following manner. The patient lies on the operating table, which is as long as the body from the head to the knees, and the feet rest on a step 18 inches below the level of the table. The hips lie within the ovariotomy pad. The night-gown is pulled up over the chest. After the preliminary shaving and disinfection, one of the prepared towels is laid across the upper part of the thighs, over a piece of rubber sheeting covering the legs. Another prepared towel is laid across the upper part of the abdomen and lower thorax. Over both of these towels and the bare abdomen between them, a piece of prepared gauze is laid, 26 inches long, 22 inches broad. The gauze is slit over the linea alba from the umbilicus to pubes, the slit pulled open, and through this opening thus guarded on all sides the abdominal operation is performed. *It is the constant duty of the operator to have a lively consciousness of what the assistants are doing with their hands,* and in case of any transgression on their part to send them to the wash basin.

" *The Dressings.*—The dressings for the wound in abdominal surgery are as simple as possible. If a drainage tube is used, a loose plug of the sterilized gauze is dropped to the bottom, to act as a capillary drain.

" The wound is thickly covered with a dry powder of iodoform and boracic acid (1–7) well mixed, and this is not disturbed until the stitches are removed from the abdominal wall on the eighth day. A thin layer of bichloride cotton is laid directly on the wound, covered with powder, and over this a wide roll of plain absorbent cotton 1½ in. thick. The whole dressing is held in place by an imbricated many-tailed flannel or muslin bandage. If the bandage is removed at any time during the first week, fresh powder is sprinkled over the line of incision.

" The nurse catheterizes the patient only if she is unable to pass her own urine, first wiping off secretions from the mouth of the urethra, and then sprinkling some of the iodoform and boracic acid powder within the vulvar orifice after each catheterization."

Such are Dr. Kelly's directions, and they give me the impression of carrying out surgical principles, according to our present lights, in

a practical manner, and one approaching perfection. American surgeons do not forget that all recent advances in wound treatment originated with Sir Joseph Lister, and admit without hesitation that his researches have revolutionized surgery.

They claim that their hospitals and nurses are better than ours, and the first I cannot deny. The American nurse, though, is a copy—in costume, manners, everything—of the Nightingale sister, but to my mind there is no nurse so perfect as a good English one.

Before leaving the subject of the Johns Hopkins Hospital, it will be well to mention that it has *the* reputation in America as a training-school for nurses, efforts being made by means of lectures to give them a sufficient amount of information. The syllabus of lectures includes: elementary anatomy and physiology; hygiene, with special reference to ventilation, heating, and drainage; bacteriology, especially in its application to surgery and medical practice; all the surgery required to ensure a certain amount of appreciation of what is being done, and enough of medicine to make the reasons for certain lines of treatment intelligible. A satisfactory examination must be passed on the subjects included in the lectures and on cookery—theoretical and practical—before a certificate of efficiency is given.

Is this too much, or are we doing too little for our nurses? I think the fault is on our side. The nurses are interested in such work for its own sake, and the smattering of knowledge so gained helps them to take a more intelligent interest in surgical methods, and naturally increases their efficiency.

The City Hospital at Cincinnati is an old building, but does a great deal of good and useful work. I spent a pleasant and profitable morning with Dr. Conner, surgeon to the hospital, who showed me several simple fractures put up in plaster-of-Paris bandages. Here, as in most American hospitals, it is the rule to put the limb up at once in a plaster bandage over a thick layer of cotton-wool. About the end of the first week, all being well, the bandage is taken off, the position of the limb examined, and another bandage firmly applied. This is left on for the remaining five or six weeks of treatment. This practice also obtains in all the German hospitals I have visited, but has not yet been adopted in the British Islands. Dr. Conner told me there was now a rage on the radical cure of hernia by different methods, but that he thought possibly ligature of the neck of the sac and its removal were sufficient and as satisfactory in result as more elaborate proceedings.

He also took me to a large Catholic Hospital in Cincinnati, with over 200 beds. It is managed by Sisters of Mercy, and there is no resident surgeon. The wards are small—in fact it is a large ordinary house, the private rooms of which have been converted into small

wards. It is remarkably clean and comfortable, and has an air of homeliness about it which is wanting in the ordinary hospital ward. Is this not the model hospital of the future ?

In Chicago I saw Dr. Senn, who has recently removed there from Milwaukee. I had no opportunity of seeing him operate, but learned from him in conversation that he had given up the use of dry decalcified bone-plates, as originally recommended by him, for, in one case of gastro-enterostomy the patient vomited the plates, and in a second case the plates had escaped from the abdominal wound. Both patients recovered, but in spite of this he now prefers plates kept in a mixture of equal parts of spirit, glycerin, and water.

The Massachusetts General Hospital, Boston.—Owing to the kindness of an old Vienna friend, Dr. Williams, physician to the City Hospital, I spent a most pleasant and profitable morning with the staff, to whom he gave me an introduction. Everything, including hospital, staff, nurses, and all else, is decidedly English at Boston. It seemed none the worse for that.

I first saw Dr. Cabot, surgeon to the hospital, do an ovariotomy. The operation was performed in a special theatre, as all laparotomies are at this hospital, which was quite isolated from the main building, and had special wards in connection with it, much the same as at Johns Hopkins Hospital.

Worsted quilted in gauze bags took part of the share in the sponging, though sponges were also used. The case I saw operated on was a tumour of large size, and several vascular adhesions were torn through, so that some blood necessarily got into the abdomen. The majority of surgeons in this country would have washed out that abdomen and drained it. Dr. Cabot did neither. He, however, sponged it dry and clean before suturing. So far as I could judge a reaction has commenced in America against drainage and washing in abdominal surgery, as I, several times, heard both condemned as mischievous.

Dr. Cabot also showed me two hysterectomies for fibroid, clamped outside, convalescent, and a bad case of double pyosalpinx doing well after operation. The results of abdominal surgery in the hospital are excellent, as one can well believe after seeing the care taken of the patients, and the strict attention to every detail enforced. In this hospital and at the City Hospital the general surgeons do all the operative gynæcology, and all over America the general surgeon does a great deal, possibly the greater part of this work. It is settled on the other side of the Atlantic that abdominal surgery, at all events, is a branch of surgery, not of gynæcology.

A case of excision of the ankle of Dr. Cabot's interested me. We would call it erasion or arthrectomy, for the old formal excision is not what was performed. The ankle-joint was opened by a semilunar

incision on each side, curving round either malleolus and missing all tendons, vessels, and nerves. The astragalus was found diseased, and excised; for, as Dr. Cabot explained to his class, if any disease at all exists in the astragalus the whole bone must be removed, its defective vascular supply making repair difficult. The os calcis was extensively diseased, but the tubercuIous foci were scraped and gouged out of it with good hopes of success, for its vascular supply is so good as to favour healing. The malleoli were left intact, and it was considered fortunate that this could be allowed, as they form an important buttress and support to the foot. Some loosened cartilage was scraped from the ends of the tibia and fibula, and all granulating tissue and infiltrated structure removed. The wound was then filled loosely with iodoform gauze, and dressed in the ordinary way. Excision of joints is somewhat of a speciality at Boston. Dr. Scudder has published some excellent results; but all over America this is a common operation, and leaves an excellent and serviceable foot. Sixteen years ago my brilliant and revered teacher, Dr. Heron Watson, frequently excised the astragalus in such cases; since then I had not seen it done, or heard of it again, till now.

In such a case nine out of ten surgeons in this country would have done Syme's amputation, and I ventured to say so in the operating theatre. Imagine my surprise at being told that if amputation had been necessary, Syme's would not have been the operation selected; that Syme's was perhaps the best operation for a wretchedly poor person; but there were few such, who could not afford a proper artificial limb; and that where money could be obtained for an artificial substitute, amputation at the lower one-third of the leg was the operation of election. This was said by one of the distinguished surgeons of the hospital, and all my remarks, even quotations from Mr. Catheart, failed to make any impression on his opinion.

Bigelow was a great benefactor to the hospital, and his name appears more than once in going round it. An operating chair in the theatre, devised by him, is a marvel of complicated ingenuity.

Attached to the operating theatre is a room for examining pathological specimens, with a pathologist in attendance. Within five minutes from the time a tumour is removed a stained section of it is mounted ready for examination. A fresh piece of the tumour is frozen by means of carbonic acid, an easier and cheaper method than ether, cut, and stained in methyl green, and, if wanted as a permanent specimen, mounted in glycerin.

Dr. Mixter has invented an ingenious tumour punch, which is in general use in the hospital. It is a cannula with sharp internal edges, which in doubtful cases he inserts into the tumour, painlessly under cocaine, and removes a portion of it for examination.

I will conclude this desultory paper with my general impressions.

American much more resembles German than English surgery. The Germans have an indescribable way of taking possession of an anæsthetized patient, giving an impression that he is entirely their own, and that they mean to do just what they like with him.

German instruments are large, artery forceps like tongs, scissors like sheep shears, retractors like garden rakes.

The German surgeon is seldom in doubt, and has an excellent embryological, bacteriological, and pathological explanation of all his cases and results. If there is any mistake, something is to blame, not the surgeon.

Then there are other German specialities, such as metal-handled knives, the invariable introduction of needles by a holder, the wearing of special operating apparel, the strict attention to asepsis and antisepsis, and the selection of only such operations as can be performed with deliberation and in open daylight. All these have more or less influenced American surgery.

Results are, after all, the test, and on these a judgment must be formed, and from this standpoint my belief is, that if English surgeons do not wish to be overtaken, they must put their best foot foremost.

(*Northumberland and Durham Medical Society: Reported in Journal*, October, 1892.)

CASE OF EPITHELIOMA OF LOWER LIP.

Mr. Morison showed a man, age 77, the whole of whose lower lip he had removed for epithelioma. Restoration had been performed by Syme's plastic operation, and the result left nothing to be desired.

CASE OF COMPOUND DEPRESSED FRACTURE OF SKULL.

A soldier, admitted to the Infirmary with a compound depressed fracture of the right parietal bone, without symptoms. Two hours after the accident he was trephined. A lock of hair was firmly wedged in between the fragments, and could not have been dislodged without elevating them. The disc of bone was cut into small pieces with bone forceps, washed well in 1–40 carbolic lotion, and the opening was packed with the débris. The wound healed by first intention without drainage. A month after the operation it was impossible to say where the trephine opening had been made, for the bone grafts had entirely filled the cavity with new bone. Some disappointment was felt now, for there was a well marked depression over the trephine hole, evidently from subsequent absorption of part of the new bone, though no portion of the opening was soft. The case was demonstrated to show the advantage of trephining on all compound depressed fractures, for without this it would have been impossible to secure asepsis, the most important consideration in head

cases ; and to draw attention to the method of bone grafting, which, especially in the case of a soldier, is necessary, to enable him to remain in the ranks, and in every instance should be employed to restore the skull as nearly as possible to its natural condition.

WOUND TREATMENT.

(*Northumberland and Durham Medical Society : Reported in Journal,* December, 1892.

The art of surgery has now outstepped the limits of a mere handicraft. Accuracy in diagnosis and manual dexterity are not the only requirements of the surgeon. Operations should be more than brilliant—they should be successful. A clumsy operator, even if his diagnosis be incomplete, may yet be more useful to the community than the most adroit surgeon. Essential to his success, however, is thoughtful purposive action and unremitting attention to detail.

The importance of a right wound treatment cannot be overestimated. The scope of surgery has been more than doubled in the last twenty years by the work of Sir Joseph Lister, who from investigations into the causes of suppuration and its consequences has taught us how they may be avoided.

The most uniformly satisfactory results in the healing of wounds made by the surgeon are obtained by the subcutaneous method of operation. A close imitation of the conditions favourable in subcutaneous healing are likely to lead to a satisfactory form of wound treatment. In such a wound :—

1. Micro-organisms, chemical irritants, and air are excluded.
2. Pressure is exercised on the wounded structures by the undivided elastic skin.
3. There is a minimum of interference with the wounded structures. No dressings, no drainage tube, no sutures, no ligatures.
4. Heat is retained by the unbroken superficial parts.

Of the four conditions favourable to the healing of subcutaneous wounds I have put in order of merit—

(1) *Exclusion of Micro-organisms, Chemical Irritants, and Air.*—That inflammation, suppuration, erysipelas, and indeed all wound complications, arise from the presence of micro-organisms and their products is abundantly proved, and that the organisms are conveyed to the wound by contact may also be accepted as practically true. The teachings of bacteriology and surgery combine to show that the virulence of the air has been over-estimated, and that the

germs which it commonly contains may be safely disregarded as a source of wound infection.*

Mischief arises by the introduction into the wound of dirt particles from the hands of the surgeon or assistants, the skin of the patient, the instruments, sponges, clothing, dressings, etc. Perfect cleanliness would ensure perfect wound healing, with little discomfort and no constitutional disturbance; but a perfect cleanliness applicable to wound treatment is unattainable by our present methods. The nearest approach to it necessitates the use of some powerful germicide; and in using this we are choosing the lesser of two evils, for we must bear in mind that one of the advantages of our ideal subcutaneous wound is the absence of chemical irritants, amongst which all antiseptics take rank in more or less vicious degree.

2. *Pressure is Exercised on the Wounded Structures by the Undivided Elastic Skin.*—The importance of properly-applied firm pressures, as a principle in surgery, is not yet sufficiently recognized. As a curative measure it has been extensively and successfully adopted; but in the prevention of inflammation and its results it has passed unnoticed. There is no single item of wound treatment deserving of more attention. Firm and careful bandaging over abundance of cotton-wool produces an elastic pressure which, by bringing the wound surfaces into apposition hastens healing, by diminishing the increased blood-flow prevents exudation, and by securing rest minimizes pain.

3. *There is a Minimum of Interference with the Wounded Structures.*—No dressings, no drainage tubes, no sutures, no ligatures. It must be apparent that the absence of all these disturbing influences is a considerable factor in securing that perfect rest necessary to perfect repair; and when the importance of damaging the tissues in the smallest degree possible is borne in mind, the disadvantage of unnecessary bruising during operation, of sluicing with antiseptics, of including large portions of tissue in ligatures, and of leaving foreign bodies, such as drainage tubes, in contact with them, will not be forgotten. It is well to remember that a former race of surgeons got fair results owing almost entirely to a respect for the vitality of the tissues; and we now recognize that invading micro-organisms have not much chance against healthy structures.

4. *Heat is Retained by the Undivided Superficial Parts.*—In no vital process is the value of heat more evident than in the healing of wounds. Where do wounds heal as they do in the peritoneal cavity? Does heat not play *the* important part in wounds of the mouth, which heal rapidly in spite of their septic surroundings and

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* *Though this is still a general belief amongst surgeons who disregard bacteriological teaching, it is not true.*

the constant disturbance to which they are exposed? Are not heat and elastic pressure the secrets of success in the Martin bandage method of treating leg ulcers?

So far my endeavour has been to suggest only the principles which should guide surgeons in wound treatment. The application of these principles demands careful consideration. I will therefore indicate the procedure that I recommend, describing in detail the technique that I adopt.

General Preliminary Procedure.—Except in cases of emergency the general condition of the patient should receive careful attention, as bearing more strongly than some might suppose on wound treatment. Especially, the condition of the kidneys, digestive organs, and nervous system require investigation; for no operation, or none but the most urgent, should be undertaken without a knowledge of their state. Anæmia, either from loss of blood or other cause, is to be regarded with suspicion as predisposing to septicæmia.

Special Preparations.—The surroundings of the patient are of considerable importance, for the statement that organisms in the air may be ignored applies only to comparatively pure air. If an operation of emergency is to be performed, nothing in the room should be disturbed more than is essential, or dust, probably mischievous in character, may be raised. A damp sheet spread over a dirty carpet, under and around the operating table, is a useful means of minimizing the danger. If the necessity for immediate operation be less pressing, a different procedure should be adopted. The room in which the operation is to be performed should be thoroughly ventilated, and all useless furniture, curtains, pictures, etc., should be removed, and it should be thoroughly cleansed twenty-four hours before the time appointed to operate.

The *dressings* that I use for a fresh wound are corrosive gauze dipped in 1–2000 corrosive lotion, and large pads of Hartmann's wood-wool wadding. The pads should be duly adjusted above the gauze, which is to be placed next the wound. As soon as a packet of gauze or wool is opened it is kept in a closely-fitting metal box.

Nail brushes are an important part of the surgeon's armamentarium, and should be kept in lidded jars soaking in 1–1000 corrosive lotion. The best are made of ordinary wood with strong bristles, and are sold at 2s. 6d. the dozen. They may be carried about wrapped up in corrosive gauze more conveniently than in bottles. When in doubtful condition, boiling for ten minutes in soda and water makes them fit for use.

Sponges are frequent sources of mischief,* and require great care

* *For some years now I have used gauze mops.*

and attention. When new, they are well shaken and beaten, in a mortar if necessary, to remove as much of the calcareous matter, sand, and débris, as possible; next they are soaked in acid water (commercial hydrochloric acid and water, strong enough to taste distinctly acid) for about four hours, or at any rate until all effervescence has ceased; then they are thoroughly kneaded in a solution of carbonate of soda and water ($\frac{1}{2}$ lb. to 3 quarts) over and over again; after this they are thoroughly washed in clean water, and finally put in carbolic lotion 1–20, where they are kept. When required for use outside they may be separately wrapped up in corrosive gauze, and can then be conveniently carried in a waterproof sponge bag. When soiled, they are frequently washed in *warm* water first, then steeped in carbonate of soda solution for twelve hours, again washed in warm water till quite clean, and finally put in a jar with 1–20 carbolic lotion. Boiling, unfortunately, ruins sponges.

Ligatures and Sutures.—For some years I have used silk for both purposes, for catgut is untrustworthy as ordinarily bought, and difficult to prepare.* It is also a convenience to have one substance which will serve for either use. The silk is first steeped for one to two hours, according to its thickness, in 1–500 corrosive lotion. Then for four days in 1–20 carbolic lotion, when it is wound on sterilized reels, and either transferred to absolute alcohol (where it is kept), or it may be rolled up in corrosive gauze and allowed to dry. Before the silk is used it is placed in the instrument tray and covered with the same lotion as the instruments.

Prolonged or frequent immersion in chemical antiseptics, or even boiling water, makes the silk friable and untrustworthy, so that it is necessary to test it from time to time; and for special purposes, such as ligaturing hæmorrhoids or ovarian pedicles, it should always be freshly prepared.

Drainage tubes are kept in clean, glass, wide-necked stoppered bottles filled with 1–20 carbolic lotion. It is desirable to keep beside them a few safety pins for transfixing the end projecting from the wound, as this is the most convenient method of preventing the tube from slipping in, and possibly being lost.

Instruments are thoroughly washed with soft soap, hot water, and a nail brush.† Then they are immersed in 1–20 carbolic lotion for

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**Ligatures and sutures have throughout been a difficulty. For some years now I have used catgut sterilized by boiling in alcohol under pressure, and it has given me every satisfaction.*

†*The instruments are now sterilized by boiling first.*

an hour before operation. When required, the lotion in which they are lying is diluted with an equal quantity of boiling water. When dirtied they are washed and brushed whilst still moist, and then dried thoroughly before being put away. They are kept lying on glass shelves in a well-made case.

The part to be operated on, except in cases of emergency, is prepared as follows: The skin surrounding and over the seat of operation is thoroughly scrubbed with soft soap and hot water. twelve hours before the operation. If the part is hairy, it is shaved at this stage. Then the area to be cleansed is rubbed with turpentine on clean lint or flannel. After this comes another rubbing with spirit soap and hot water to remove the turpentine. Asepsis is further secured by covering the whole part with a towel, which, after soaking in 1–1000 lotion, has been wrung nearly dry. This is maintained in position by a bandage until the operation is about to be commenced.

The surgeon's hands are treated in the same fashion with scrupulous care. First, they are washed with soft soap and hot water, and the nails carefully cleaned—preferably with a bone picker—then scrubbed with turpentine and again with soap and hot water, till all traces of turpentine are removed. Finally, they are soaked in 1–2000 corrosive lotion for at least two minutes. It should be distinctly understood that no one, unless cleansed as the operator, must touch sponges, instruments, or the neighbourhood of the wound, and if the hands of the operator or those of his assistants have necessarily been brought in contact with anything not specially purified, they should at once be thoroughly washed in 1–1000 corrosive lotion before being used again.

A considerable area all round the wound should be covered with towels wrung in 1–40 carbolic lotion. The wound is thus isolated in the centre of an antiseptic circle, and is to be protected from contamination by blankets, clothing, etc., which are all covered by the antiseptic wrap. Instruments, too, can be laid on the towels without fear of their being harmed. Immediately before commencing the operation the patient's skin is washed, first with 1–1000 corrosive lotion; also the surgeon's assistants', including nurses' hands, and this is washed off with 1–5000 corrosive lotion.*

Take as an example a case of excision of the breast and axillary glands. With everything prepared as stated, the operation is commenced. Sponges, wrung as dry as possible, are used to find the

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* *Sterilized clothing for operator, assistants, and nurses, with indiarubber gloves, caps, and masks, diminish the dangers of septic infection, and it is unjustifiable not to use every known means to this end.*

bleeding points. These are ligatured with silk, every possible bleeding vessel receiving attention. The operation is completed by packing the wound with thin sponges, and introducing, but not tying, the silk sutures.

When a sufficient number of sutures is fixed—and by clamping the ends with hæmostatic forceps they may be conveniently prevented from slipping out—the sponges are withdrawn, and the wound, left thus quite dry, closed by tying the sutures. Additional stitches are generally required to secure perfect apposition. The closed wound being covered with a sponge, the surrounding surface and arm are cleansed with warm lotion, and the wound is now fairly covered with a pad of corrosive gauze, four to eight layers thick, wrung out of corrosive lotion. A pad of wool is next placed between the arm and lateral chest wall, and is kept in position by the upper arm placed against it. The patient is then drawn over the head of the table, her back cleansed, and the dressing completed by a large pad of wool over chest and back, firmly bandaged in position with a long, broad, and strong flannel bandage, only half of the forearm and the hand being left free.*

The course of a case so treated will be as follows :—

On the second evening after operation the temperature will reach its highest record, 99° to 101° F. On the fourth day the patient will sit up unaided in bed; from the fifth to the seventh day she will get up, walk to a chair, and sit for a time. On the eighth day the dressing will be removed, sutures taken out, and the wound will be practically healed; from the tenth to the fourteenth day, in fine weather, she will get out.

The fixed position of the arm and some aching in the back are the chief complaints when enquiries are made as to the presence of pain. Such has been the exact course followed in twenty-four out of the last twenty-five cases on which I have operated. The case that failed was one in which a large ulcerating scirrhus made it difficult to get the skin properly purified.

A similar result may be expected in other cases. The following are recent examples :—

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* *With the exception that I now use catgut ligatures and sutures; gauze wrung out of hot saline to cover the wound, because the antiseptic occasionally caused sloughing of the flaps; and that I scarify the flaps to diminish the risk of their death, my present procedure is the same. My views are that drainage is unnecessary if interrupted (not continuous) sutures are used for the skin, and that prolonged rest and non-use of the arm are aids to permanent recovery. The first dressing is left untouched for two to three weeks.*

A man, age 35, with advanced tuberculous disease of the knee-joint and spinal caries. Amputation in the middle of the thigh. Slept well the night after the operation. Temperature never over 99° F. Out of bed on the fourth day. Healed on eighth day, when dressings were changed for first time and sutures were taken out.

A woman, with tumour of right lobe of thyroid gland, which proved to be a rapidly-growing sarcoma. Right lobe of thyroid removed. No disturbance from operation. Wound healed when looked at for first time on ninth day.

A man, middle age. Skull trephined in two places for purposes of exploration. Discs of bone removed by trephine were chipped into small fragments, with which both trephine openings were filled. Both wounds soundly healed on ninth day. A month later complete consolidation with perfect regeneration of skull.

A child, with immense mass of tuberculous glands in neck, involving an extensive dissection for their removal. Wound healed throughout on the eighth day, when dressings were removed for first time.

A woman, with lipoma of abdominal wall, the removal of which left an incision one foot long. Wound entirely healed when dressings were taken off for first time on eighth day.

A man, on whom Halsted's operation for the radical cure of hernia had been performed. Wound entirely healed on tenth day, when dressings were taken off for first time.

In all abdominal sections, unless a drainage tube has been left in, complete healing may be expected by the tenth day if good apposition of the wound surfaces is secured.

Further detail would be tiresome; suffice it to say that, given a case not yet putrid, the surgeon must look for explanations of failure to himself or his methods if he cannot secure such results.

This method, however, requires great care and attention to detail, and some experience. For a surgeon not practised in such matters, or where much damage has been inflicted on the tissues, or in case of doubt as to the thorough carrying out of all the precautions mentioned, the wound is flushed and drained. The flushing is performed with a profusion of hot (105° F.) corrosive lotion, 1–10,000, poured over the whole wounded surface immediately before closing the wound. A full-sized drainage tube is introduced, and left for forty-eight hours, when it is removed, and the wound re-dressed with the same precautions as were taken at the operation.

In every case where dressings are changed, as strict precautions are taken as in the first instance to avoid contamination of the wound.

The dresser must be as careful in his ablutions, and must take the same care as was done before. The dressings may be moistened with warm 1–5000 corrosive lotion, to aid their separation, and on the

wound being exposed, a warm, moist layer of corrosive gauze should be laid over it. This should be kept on whilst the skin which has been under the dressing is being bathed with 1–5000 corrosive lotion. The bathing relieves itching and other discomfort, but unless the wound is covered up detached flakes of epidermis or dirt, insufficiently acted on by the antiseptic, may be swept on to the wound and cause mischief.

If the case is one of urgency, and a fresh wound already exists, the wound itself is carefully washed and freed from all foreign bodies with a clean sponge and corrosive lotion, 1–1000. Any pockets in the wound receive most careful attention; and if there is any doubt about the possibility of thorough cleansing, as in most compound fractures, the wound is enlarged freely to allow of it. A sponge wrung out of a solution consisting of equal parts of 1–500 corrosive lotion and 1–20 carbolic lotion is fixed over the wound as soon as the cleansing process is completed. If the wound is more than two or three hours old, or has got dirt of any sort ground into it, a thorough scrubbing with carbolic acid and spirit, 1–5, precedes the washing with corrosive lotion. With the sponge, as before pointed out, fixed over the wound, the skin and surroundings are thoroughly cleansed as previously described. The only difference made may be that more vigorous scrubbing of the skin is employed in the latter than the former case; and even on parts devoid of hair, shaving, with 1–20 carbolic lotion and soap, aids in the removal of dirt so effectually that I frequently do it. With all preparations concluded, the sponge is taken off, the wound is freely douched with 1–5000 corrosive lotion, sponged dry, drained, sutured, and dressed. In making a wound deliberately, if contact sepsis is avoided in some such way as has been described, irrigation is unnecessary and injurious, for all antiseptics cause more or less irritation and damage the tissues.

No more of the antiseptic than is unavoidably present on the surgeon's hands, instruments, or sponges, should, therefore, come in contact with the wound. A good rule is antiseptic precautions before operation; aseptic precautions as far as possible during operation. In the case of a wound already made, probably with dirty instruments, and coming into contact afterwards with dirty surroundings, a choice of two evils has to be made—either the risk of wound-infection has to be run, or the disagreeables attending the energetic use of powerful antiseptics have to be encountered. There is abundant evidence to prove that the latter must be selected.

The dressings require removal:—

1. If there is pain beyond a moderate degree.
2. If the temperature rises.
3. If discharge comes through the dressings.

If drainage tubes are used, an early dressing for their extraction

is necessary. About the third day is a good time in fresh wounds. Unabsorbable sutures require another dressing about the tenth day for their removal, when most wounds would be healed.

For the proper treatment of wounds it is unnecessary to have complicated apparatus and unworkable methods. The most excellent results are obtainable with simple means if only the principles are kept in view. It is no excuse when a wound goes wrong to blame the absence of material and apparatus, and I will describe a method by which, in an emergency, a serious wound may be treated with expectation of a favourable result. The requirements are: Soft soap, a nail brush, washing soda, turpentine, a large pan, a fire, towels, water.

The cleansing of patient, operator, and assistants is conducted in the manner described previously. The nail brush and towels are boiled for ten minutes in the pan filled with a solution of soda in water (one heaped tablespoonful to each quart). Silk, if required for ligatures or sutures, is also put in the pan and boiled for the same length of time. If only dirty instruments are available (and all instruments, unless specially cleaned, must be so regarded), they must, after scrubbing with soap and hot water, be boiled for ten minutes in the soda solution. The whole apparatus so treated is now sterile and ready for use. The wound is washed with soda solution allowed to cool for the purpose, the instruments are covered by the same, and the operation area is surrounded by sterile towels. Well wrung, they take the place of sponges. Finally, several of the purified towels put on wet serve as a dressing, which soon dries from the heat of the part.

Similar preparations and precautions are as necessary in the case of wounds already putrid as in fresh ones.

It is bad surgery to become careless because a wound has gone wrong. Disaster may follow the introduction of mischief into a wound already heavily handicapped, and thus more prone to become further infected. Putrid granulations and tissue of limited extent may be dissected or scraped away, and the wound so reduced to the condition of a fresh one, capable of being so treated. Where this cannot be done, free drainage must be the first consideration. If necessary, incisions should be made in suitable, dependent positions to secure this, and full-sized drainage tubes introduced. Free irrigation with 1–10,000 corrosive lotion, should then be practised, and after drying iodoform may be lightly, or dry boracic powder liberally, dusted into and over the wound. The whole is now covered with gamgee tissue, over the outside of which is placed a layer of gutta-percha skin, to prevent evaporation. This dressing should be frequently changed, and at each renewal of it free irrigation of the wound and cavities must be carried out as at first.

For wounds in or near the natural orifices, and so unsuitable for ordinary treatment, e.g. anus, mouth, and genital tracts, iodoform is invaluable. Though it is not a perfect germicide, and its use in fresh wounds is consequently to be condemned, it has been proved clinically to be better in such cases than ordinary antiseptic preparations. The same statement may be made concerning boracic acid, which appears only to be less energetic. They are both conveniently kept in a pepper-box, and sprinkled over the affected part. In using iodoform it should be borne in mind that a too lavish use of it has been followed by disagreeable symptoms, the earliest of which is a strong taste and smell of the drug experienced by the patient.

The special dressings described are those I have been using of late years, but as early as 1878, in a paper read before the South Durham and Cleveland Medical Society;* again, in 1881, in the *Birmingham Quarterly Review*; and again at the February meeting of the Northumberland and Durham Medical Society, in 1886, I advocated the same principles and reported results of many major operation cases healed under one dressing, and I then maintained that this should be the rule. So far as I can learn, no one else had suggested such possibilities in 1878, or for many years later.† At the present time the majority of surgeons aim, with success, at getting wounds healed under one or two dressings.

Every school has particular lotions, dressings, and methods, frequently changing, but tending to get simpler and more effectual with the lapse of time. Gamgee tissue, corrosive wool, sal alembroth wool and gauze, salicylic wool and silk, boracic lint and wool, and a host of others might be mentioned. All are good and useful, perhaps equally so, if the principles governing wound treatment are kept in mind and intelligently carried out.

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* *This paper cannot be found.*

† *It is curious to observe how slowly progress is made in surgery. In the last number of the "Transactions" of the Southern Surgical and Gynæcological Society*, 1913, *p.* 228, *Dr. Rodman, in a discussion on cancer of the breast, says with regard to after-treatment: "Drainage I have also abandoned as unnecessary. The wounds heal quickly;" and in a recent visit to the clinic of Dr. Royal Whitman, of New York, I saw him operate for excision of the knee, and because no blood-vessel was tied, no drainage tube used, and a permanent dressing put on, he considered he had made a novel advance. More than twenty-five years ago I had many amputations, excisions of joints, and breasts and tumours heal under a single dressing.*

1893

(*Northumberland and Durham Medical Society : Reported in Journal*, November, 1893, p. 25.)

FOUR CASES OF MALIGNANT DISEASE OPERATED ON FOURTEEN MONTHS AGO.

The four cases of malignant disease operated on fourteen months ago, within a week of each other, which I intended to show to-night, have not all come up for exhibition. They were :—

1. A man of 78, the whole of whose lower lip I excised for epithelioma, making a new lip by Syme's method. He is here perfectly well and without any deformity.

2. A woman of 35, one lobe of whose thyroid gland I removed for a round-celled sarcoma, embedded in the right half, and pressing on the trachea. So far as I know she is the only recorded case of malignant tumour of the thyroid successfully operated on. She is here, quite well, and with a trifling scar.

3. A girl of 19, half of whose lower jaw I removed for sarcomatous tumour. I have seen her within a month. She is free from recurrence, and in good health, but has not come up to-night.

4. A man, 42, with a sarcomatous tumour in the popliteal space. The tumour involved and blocked the popliteal vein, 4 in. of which was removed along with the growth. He continued well for eleven months after the operation, when pain was complained of, and referred to the distribution of the sciatic nerve of the leg opposite to that operated on. He has at present a recurrent nodule in the popliteal space ; a malignant mass in his lower abdomen pressing on the lumbar and sacral plexuses, and subcutaneous nodules in different parts of his body.

Thus three out of four cases of serious forms of malignant disease still continue free from return after fourteen months interval. It is too early yet to say that they are definitely cured, but to get well over the first year after operation is a very important test, and makes the probabilities strongly in their favour. I regard them as a great encouragement to the performance of complete operations in malignant disease, of which I have long thought our prognosis is apt to be too gloomy.

Case 1 is particularly interesting on account of the patient's great age, which might have been regarded as a bar to operation. Taking the view I do, that old people bear even serious operations well, and that free and complete removal of a malignant growth is seldom in them followed by a return of the disease, I strongly recommend operation.

CASES OF SYPHILIS.

The first case I have to show is this woman, 34 years of age, with an ulcer on the left side of the bridge of her nose. The case has been treated

as one of lupus, and the interesting feature in it is the diagnosis. Lupus may I think be dismissed without further consideration. The ulcer might be mistaken for epithelioma or rodent cancer. A careful examination of it, however, will satisfy anyone that it is neither one nor the other. Its base is covered with florid large granulations, and is not indurated. The edges are undermined and puffy. The perforation through the nasal bones is small, and there is no bare bone round it, as would have been the case if it had been due to either rodent ulcer or epithelioma. On examining the throat, a small perforation is visible in the soft palate, corroborating the view taken that the ulcer is the result of a broken-down gumma.

The second case is that of a man, 62 years of age, who gives a history of syphilis contracted twenty years ago.

His tongue had never been healthy since shortly after this time.

On examination the tongue is seen to be a well-marked example of chronic superficial glossitis (leucoplakia, ichthyosis linguæ, etc.). Near the tip and on the right border an ulcer about the size of a sixpenny piece is seen. Far back on the dorsum, about the centre, a patch of warty growth is present.

The interesting feature in the case is in the diagnosis of the ulcer. Is it an epithelioma, or something of a more innocent character ?

The result of treatment for a fortnight with iodide of potassium internally has been to remove the stabbing pain of which he complained, and the salivation which was present ; but too much importance must not be attached to this, for the same thing frequently may and does occur in undoubted epithelioma of the tongue where there is no specific history. The ulcer has not healed ; the base of it remains indurated and tender. I believe it to be an epithelioma following, as frequently happens, on this form of chronic glossitis. I have operated on similar cases, and on examining them microscopically have found in every one conclusive evidence of their malignant nature. In this stage, however, it is not necessary to remove the whole tongue, for I have under observation patients in whom I did a partial resection, in one two years, and in the other three years ago, and they continue well. It is only necessary to go wide of the growth, for it does not appear to have the same tendency to recur or involve the lymphatic glands as the ordinary tongue epithelioma shows.

CASES OF SYPHILIS.

(*Northumberland and Durham Medical Society : Reported in Journal,* December, 1893,)

Case 1.—A man, 21 years of age, who contracted syphilis four months ago. The hard chancre was still unhealed. The interesting feature about this case was one always very suggestive of the syphilitic nature of an eruption, viz., its multiform character. The whole skin was covered with an eruption consisting of rose rash, papules, vesicles, pustules, squames and crusts. The skin was not itchy.

Case 2.—A man, between 50 and 60 years of age, with necrosis of the tibia. On examination his whole tibial shaft was found to be uniformly enlarged. It was three times the thickness of the opposite tibia. At the junction of the upper with the middle third there was a small sinus, at the

bottom of which a hard, fixed, superficial sequestrum could be felt with the probe. There was a history of pain in the leg for months, which had been worse at nights, and deprived him of sleep. We have then to deal here with a case of chronic diffuse osteitis. Two similar cases, though in younger men, which were under my care, were reported by Mr. Brewis in the *Northumberland and Durham Medical Journal* for April, 1893, p. 225, and the opinion I then expressed was that such a condition was likely to be produced by either tubercle or syphilis. In this case, as in the others, I believed syphilis to be the cause, for: (1) The bone destruction would have been greater in so extensive a tuberculous osteitis; (2) The destructive process would more probably have caused caries in a tuberculous osteitis than necrosis, as in this case; (3) The age of the patient would be in favour of syphilis; and (4) The result of treatment by iodide of potash, which the patient has been taking during the last ten days, is much in favour of syphilis, for he has now lost all his pain and tenderness, and finds the leg no further inconvenience.

Cases 3 and 4.—Two cases of extensive ulceration of the gums, and round the front teeth of the upper jaw. On inspecting the mouths of these two patients a very striking resemblance is noted. On closer examination we find however in this man (3) that the ulceration extends from the gums on to the hard palate, behind the front teeth, and that the ulcer on the palate has a triangular shape, with base in front and apex behind, having, in fact, an area and a shape very closely corresponding with the outline of the intermaxillary bone. In Case 4 the ulceration is limited to the gum. Case 3 has suffered from certain tuberculous lesions. He has at present a chronically enlarged gland in the neck, and gives a history of large chronic abscess in the back some years ago, which has left a big depressed cicatrix. Case 4 gives a history of syphilis ten years ago, which is corroborated by a large typical cicatrix on his soft palate. Both cases have been difficult to treat and are making very slow progress. There is one point on which I would like to have the benefit of the experience of others in connection with Case 3. It is this: Has anyone noticed the triangular shape of the ulceration behind the upper front teeth in other tuberculous cases? The only other similar case I can recall occurred in a tuberculous subject. Similar forms of ulcerative stomatitis occur in a variety of diseased states, e.g., mercurialism, scurvy, diabetes, etc., so that I think we cannot call such conditions by any specific name.

Cases 5, 6 and 7 are examples of epithelioma, developing on a tongue affected by chronic superficial glossitis. Case 5 shows a slight form of the tongue affection—a dry, white, rough surface, and a small hard-based ulcer, the size of a threepenny-piece. Case 6, a tongue fissured and covered with thick white patches, and in one place on the dorsum a warty growth. At this point there is a raised ulcer, the size of a shilling, with a hard base. Case 7 has a tongue fissured and scarred, with white patches, warts, a large epitheliomatous ulcer, and secondary malignant disease affecting the cervical glands.

1894

SUBCONJUNCTIVAL HÆMORRHAGE LIMITED TO THE OUTER PART OF THE EYE A SIGN OF FRACTURE THROUGH THE CORRESPONDING ORBITAL PLATES.

(*The Lancet*, January, 1894, p. 16.)

The accompanying illustrations are made from two patients recently under the care of Dr. Hume, in the Royal Infirmary, Newcastle-on-Tyne. I am indebted to him for permission to make use of his cases. The drawings illustrate a frequent condition—a roughly fan-shaped hæmorrhage in the outer aspect of the eyeball. This follows injury to the forepart of the skull, and is, I believe, associated —at all events in the great majority of instances—with a fracture through the orbital plate corresponding to the eye affected. *Fig.* 1 represents the left eye, which alone was affected, in the third week after the accident. *Fig.* 2 represents both eyes of a patient on the seventh day after the accident. The diagnosis made in both on admission was fracture of the anterior fossa; but as recovery followed in each case this opinion was not verified by post-mortem examination. Three cases in which I had the opportunity to make a post-mortem examination after noting during life the presence of this lesion have served to convince me that this sign is of considerable importance. Hence the present communication. The following are notes of my cases :—

Fig. 1.

Case 1.—A boy, age 9 years, was knocked down by a cart and stunned. On the following day he was running about, appeared to be well, and made no complaint. Ten days later he died of pneumonia, apparently the result of cold, and unconnected with the injury. At the time of his death his left eye was in the condition seen in *Fig.* 1. At the necropsy a fissured fracture was seen to extend from a little above and behind the right external angular process across the right orbital plate of the frontal bone.

Case 2.—A youth, aged 18, fell from a scaffolding into the hold of a ship (over 30 ft.), and, in addition to an injury to the head, sustained internal damage, from which he died on the seventh day. A fan-shaped hæmorrhage was present on the outer part of his right eye at the time of his death. At the necropsy a fracture in the right frontal bone was seen to extend from the left of the middle line above into the right orbital plate below.

Case 3.—A man, age 45, was admitted to the Royal Infirmary, Newcastle, with a head injury, being unconscious and bleeding from his nose. In two days he recovered consciousness, and for two weeks appeared to be going on well. Two days before his death he complained of violent headache and began to vomit. There was no rise of temperature till four hours before his death. Post mortem a fan-shaped hæmorrhage was noticed on the outer side of both eyes, as in *Fig.* 2, though in a more advanced stage

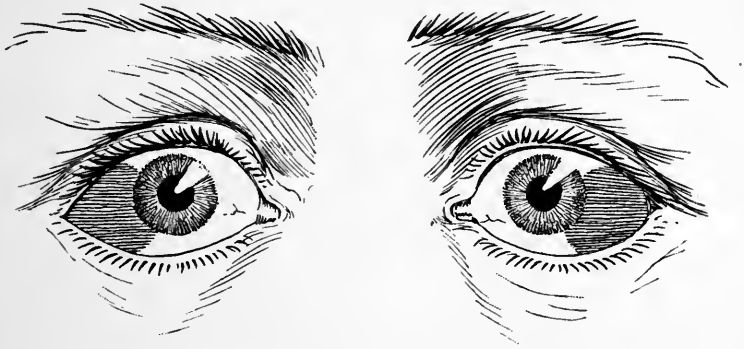

Fig. 2.

than in *Fig.* 1. An unhealed wound was present over the upper part of the right side of the frontal bone. Under this a fracture was found extending downwards and running through the right orbital plate, across the ethmoid, into the left orbital plate for about half an inch. A V-shaped fracture extended from the centre of the fissure through the right orbital plate into the internal table forming the posterior wall of the frontal sinuses. The inner table was loose, and the frontal sinuses were full of pus, thus accounting for the purulent meningitis which had caused death.

Remarks.—The shape of the hæmorrhage is not due to the pressure of the lids, for in the patient from whom *Fig.* 2 is taken both eyes were closed for some days by extravasation into the lids. Neither is it a hæmorrhage limited by the sheath of the external rectus. Though it is easy to say what it is not, a satisfactory explanation as to why it should be limited to this particular region is more difficult. The presence of a quantity of loose cellular tissue in the outer part of the orbit, and the fact that there is more room here than elsewhere may account for a small hæmorrhage showing itself

in this special position; the shape in the later stages, as seen in *Fig.* 1, being largely determined by the pressure of the lids.*

TUBERCULOUS DISEASE OF THE ELBOW-JOINT.†

FROM MR. RUTHERFORD MORISON'S OUT-PATIENT DEPARTMENT. REPORTED BY MR. R. H. MORGAN.

(*Northumberland and Durham Medical Journal*, March, 1894.)

A boy, R. M., age 8, first came to the out-patient department of the Royal Infirmary on Feb. 1, 1893.

He was then a weak, sickly-looking boy, with all the symptoms and signs of tuberculous disease of the synovial membrane of the elbow-joint, tending to suppurate, and commencing to involve the articular ends of the bones. The joint was swollen, red, hot, and tender, and there was starting pain in it, worse in bed, and keeping him awake at night.

Mr. Morison ordered the following treatment: An outside and inside rectangular splint of poroplastic material; the outer reaching from the shoulder to beyond the tips of the fingers, the inner from the axilla above to the same point as the outer below. The splints were well padded with cotton-wool, and a bandage carefully applied over the whole so firmly as to admit of no movement whatever, and the arm was worn in a sling. A week after the application of the splints, the patient returned looking already much better and free from pain. The dressings were worn in this way till July (i.e., for six months), when the tips of the fingers were set free by shortening the splints. In October the whole hand was allowed movement. On Jan. 16 the elbow-joint was carefully examined, and found to be in a satisfactory state. All swelling had disappeared, the joint could be moved in every direction, it had no pain in it, and the general appearance of the patient was materially improved. He was however ordered to wear some support for another month.

This is one of a series of cases which have been similarly treated, that is, by absolute rest of the diseased joint, and all that I have seen have resulted equally successfully. Ankylosis results from inflammation, not rest, and *the best preventive of stiffness is complete rest*, though some amount of stiffness may not always be avoided.

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* *Though this is undoubtedly a valuable sign, I know from post-mortem proof that it can occur without a fracture.*

† *To encourage students in carefully observing out-patient cases, I offered small prizes for the best reports, and after editing, published some of them in the "Northumberland and Durham Medical Journal."*

A CASE OF VARICOCELE.

Reported by Mr. Leonard.

(*Northumberland and Durham Medical Journal*, March, 1894.)

G. W., age 37, married, came to the Infirmary in February 1894, complaining of pain in the back, nocturnal emissions, and a dragging in the scrotum.

Family History.—Patient is the only surviving child of a family of thirteen. The rest all died in infancy.

Previous History.—He was always delicate as a child, but he cannot remember ever having any serious illness. From the age of 14 he practised masturbation until the age of 22, very frequently. Between 22 and 23 years of age he went occasionally with prostitutes. At 23 years of age he married, and committed great sexual excesses. He has two children, the youngest being two. Except for his sexual history there is nothing noteworthy.

History of Present Illness.—Four years age he began to notice pains of a dragging character in the left side of the scrotum, and then observed a soft mass in addition to the testicle. Three years ago he found his sexual powers were flagging, and he began to be troubled with nocturnal emissions. For the last two years he has suffered from pain in the back. His bowels have always been regular. He has consulted 'quacks,' who told him his illness proceeded from his semen being absorbed into his blood.

Present Condition—General.—Patient is a slimly-built man of about 5 ft. 6 in. in height, and weighs 8 st. His expression is anxious, his manner fidgety, and he has a worn-out look. Complexion pale. Tongue large and red at the edges.

Local.—When patient stands up, a swelling is seen on the left side of the scrotum. The skin covering is normal. On palpation, the swelling is found to be a soft compressible body, above and partly surrounding the left testicle. It has the size and shape of an inverted auricle, and is about an inch thick. It feels very like the bag of worms usually described. The testicle is definitely smaller and less firm than the right. On lying down the swelling is less marked, and is readily reduced by moderate pressure. It returns when he rises, even though the finger is kept over and blocks the external abdominal ring. The swelling distends when he coughs, and a distinct thrill is felt in it.

Etiology.—Four reasons are given for this condition being more common on the left side.

1. That the left testicle hangs lower than the right; therefore the column of the blood to be supported by the left vein is greater.

2. That the left vein enters the left renal vein at a right angle; while the right vein opens obliquely into the vena cava; therefore the current in the left vein is retarded and not helped.

3. That the pressure in the left renal vein is higher than in the vena cava.

4. The sigmoid flexure, when loaded from constipation, lies over and presses on the left spermatic vein.

Treatment.—Mr. Morison did not advise operation, because the varicocele, though large, caused little inconvenience, and was not causing the patient mental distress. Operations affecting the sexual organs of neurotic men and women were most unsatisfactory. A mixture of magnesia and rhubarb was ordered, and advice given as to his future conduct.

The case shows :—

1. That varicocele is not a disease limited to adolescents.
2. That marriage does not cure every case.
3. That wasting of the testicle is at times a consequence of varicocele.

The patient returned a fortnight later, saying he was decidedly better in every respect.

HUNTERIAN CHANCRE OF PECULIAR TYPE IN AN UNCOMMON SITUATION.

REPORTED BY MR. PERCY WITHERS.

(*Northumberland and Durham Medical Journal*, March, 1894, p. 259.)

R. B., age 20, came as an out-patient to the Royal Infirmary, Newcastle, on January 31, 1894. He had a urethral discharge, profuse and purulent, which had been going on for about a fortnight. On the inner side of the left thigh, some 2 or 3 in. below the fork, there was an oval semi-fluctuating swelling, red in colour, with a red zone round it, and about $\frac{3}{4}$ in. in length. The skin over it was unbroken. There was no induration. He said it began as a pimple two days after the running, and got gradually larger, and was always moist. The inguinal glands were all enlarged and hard. There was no induration in the urethra, and no evidence of chancre other than the peculiar patch on the thigh.

A week later (Feb. 7) the patient returned with syphilitic roseola on his chest and abdomen. The chancre (?) quickly disappeared whilst he was taking mercury, and by Feb. 20 had gone ; a deep brownish stain marking the place where it had been.

A CASE OF TUBERCULOUS TESTICLE.

REPORTED BY PERCIVAL DAVIDSON.

(*Northumberland and Durham Medical Journal*, March, 1894, p. 392.)

J. C., 42 years old, a cabinet maker, complains that his left testicle is large and slightly painful.

History of Illness.—Three months ago the patient first noticed that his testicle was swollen and slightly painful. It gradually grew worse until three weeks ago, when it became acutely painful, inflamed, and enlarged ; the acute attack lasting for nine days, when it subsided, leaving matters much as they were before. He had become much thinner and weak during the last three months, and had occasionally suffered from diarrhœa. For the last three weeks he had had a cough with expectoration, but had spat no blood.

Former Health.—Had gonorrhœa eighteen years ago, followed by gleet, which lasted three months. Nothing since. No history of syphilis or enlarged glands, abscesses or cough.

Family History.—All family healthy. No tuberculous member known.

Present Condition—General.—The patient is a sallow, thin man, not appearing to be in robust health. His lungs are free from signs of phthisis, and there are no traces of syphilis discernible.

Local.—The scrotum on the left side is seen to be enlarged by a swelling in it. The skin of the scrotum is neither red nor œdematous, and not altered

in any other way. On palpation, the swelling is found to be limited to the epididymis, which is much enlarged, hard, and slightly tender. The globus major and minor are especially well-marked, standing out as distinct rounded masses above and below, and the body, from its hardness and swelling and sharp margin, can be readily distinguished from the normal testicle in front of it. The whole mass forms a swelling the size of a duck's egg. Testicular sensation is present. The whole cord is fuller on the left than on the right side. The vas is not definitely thicker and is not nodular. The prostate, bladder, kidneys, and the opposite testicle show no signs of disease. There are no enlarged glands.

Diagnosis.—The age of the patient and the limitation of the disease to the epididymis are against the swelling being due to *malignant growth*, which occurs preferably at the two extremes of life, in youth and old age, and involves testicle and epididymis together.

Syphilis may be excluded by the history, by the absence of other signs of it, by the nature of the swelling, and by the presence of testicular sensation. In syphilitic disease the body of the testicle is first involved, except in the rare form of syphilitic epididymitis, which occurs in the secondary stages of the disease, and testicular sensation is early abolished.

It is not secondary to a urethritis, for there has been no symptom of this, there is no sign of it, and the amount of swelling is too great for an ordinary *chronic epididymitis*.

The most probable diagnosis is tuberculous disease of the epididymis. In favour of this are the ill-health of the patient, the insidious commencement of the disease, its limitation to the epididymis (for tuberculous disease of the epididymis is as common as a similar affection of the body of the testicle is rare), and the history of the inflammatory attack with threatened suppuration; for we know that a tuberculous epididymis has a great tendency to soften, break down, suppurate, and leave obstinate sinuses.

Treatment.—The disease appears to be limited to the one side, but all we know of such conditions teaches us to expect that sooner or later the prostate, bladder, kidneys, and the opposite testicle will become affected if nothing can be done to arrest the natural progress of the disease. No specific has yet been discovered against the tubercle bacillus, and in the present state of our knowledge the only rational treatment is to excise or destroy all localized foci of tuberculous mischief which are amenable to surgical measures; thus destroying the seed, and by improving the general health of the patient with fresh air, good food, hygienic aids, and suitable tonics, to render him a soil unsuitable for further attack. In such a case it is not essential, though probably best, to remove the whole testicle. In two cases Mr. Morison had dissected off the epididymis, leaving the testicle behind; in one with success, in the other castration was subsequently performed. The testicle has probably duties to perform to the individual as well as to the race.

TWO CASES OF IRRITABLE BREAST.

Reported by Septimus Basham.

Case 1.—The patient is a thin, nervous, anxious-looking little woman, age 48 years.

Twelve months ago she felt a pain in right breast, and under the outer edge of the pectoralis major, which got gradually worse. Six months

ago the pain became almost unbearable, and she noticed a lump in the gland.

The patient, to relieve the pain, rubs and handles the breast sometimes twenty times a day. Menopause occurred five months ago; but previous to that she had been unwell every fortnight.

On grasping the breast from the front a large hard mass of a somewhat pyriform shape, with distinct outline, can be felt; though with the flat hand pressed against the breast, and on examining from behind and also with the patient on her back on a couch, the swelling is not distinct. It is freely movable in all directions; the skin is not adherent, although there is slight retraction of the nipple.

No enlarged glands can be felt.

There is great hyperæsthesia and pain radiating along the course of the intercostal nerves, and up the neck and down the arm.

Taking into consideration the age of the patient and the retraction of the nipple, scirrhus is suggested. Against this view, however, is the fact that there is no tumour, non-adhesion of the skin, and absence of enlarged glands after so long a time. There is, and has been from the commencement, pain and hyperæsthesia out of proportion to any known organic change.

It may not be out of place here to point out the conditions which most closely simulate scirrhus. These are:—

1. A specially hard knot in the gland, the subject of chronic mastitis.
2. A small deep collection of pus surrounded by a zone of inflammatory thickening or fibrous tissue.
3. A small fibro-adenoma in a middle-aged person.
4. A solitary, tense, deeply-seated cyst.

All cases of breast tumour in women of middle age should be explored by incision as soon as discovered, and treated at once according to the indications offered by the exploration.

Case 2.—Mrs. C., age 30, married eight years; has had two children and two miscarriages.

This patient also is thin, and has a worried look. For twelve months she has had pain in the left breast, which passes up the front of chest into the neck and axilla, and is worse on exertion.

Patient has noticed that after the pain has been especially severe, an eruption (herpetic ?) makes its appearance on side of neck and over left clavicular region.

On examining breast, no tumour or abnormality of any kind can be made out. There is, however, great hyperæsthesia all over the gland and chest wall.

Patient menstruates every three months, and the flow is scanty. She complains of great constipation and intense headache, is very nervous, and has been treated for "neuralgia of the heart," and many other fanciful disorders.

It may be worthy of note that in both these patients there is:—

1. Menstrual irregularity.
2. Mental depression, and history of 'nerves.'
3. Marked constipation.
4. Intense headache.
5. That both are remarkably rebellious to treatment.

TWO CASES OF SYPHILITIC ULCER OF FACE, SHOWING THE IMPORTANCE OF A CORRECT DIAGNOSIS OF SUCH CONDITIONS.

Reported by Percy Withers.

Case 1.—L. B., age 39, came as an out-patient on May 23, with extensive ulceration of nose and lip, which greatly disfigured him. The fleshy part of nasal septum below the cartilage was entirely gone; also a crescentic piece, about as large as a little finger nail, had ulcerated away from lower part of the left ala, leaving ragged edges. Above this, and reaching to the border of the nasal bone, was a superficial ulceration, surrounded by cicatricial tissue from previous ulceration. On the upper lip, to left of the middle line, was an oval, punched-out ulcer, nearly an inch in length. Patient had a chancre twenty years ago, and had suffered from sore throats ever since. Eighteen months ago a pimple came on the left side of the nose, and ulcerated later. For some time there was a tendency to healing, but finally the sore spread until it advanced to the condition above described. Pot. iod. (gr. 10, ter in die) and ung. iodoform were prescribed. After three weeks' treatment the condition has improved wonderfully. The notch on the ala of the nose is filling up with healthy granulations, and the ulcer on the lip is rapidly healing, necessarily leaving considerable deformity.

Case 2.—I. H., age 39. Three years ago patient came to the Infirmary with redness and spots on the nose. The condition was treated as lupus, the nose being scraped. Within a few weeks the rash again appeared, spreading from the previous site over both cheeks. An independent eruption also came out on the forehead, reaching the margin of the hair. Six months after her first visit patient returned. The notes then taken remark: "Tuberculous masses about face showing tendency to spread serpiginously; circular patch of pustular eruption over left scapula." There was great disfigurement. Ung. iod. was given for the face, and pot. iod. (gr. 5, ter in die) internally. At present the face is quite well, and the skin is healthy; though on cheeks and nose and forehead there are many irregular white depressions resulting from the original treatment. The treatment is now continued for syphilitic manifestations other than that of skin.

ADENO-SARCOMA OF NECK GLANDS.

Reported by Percy Withers.

Case 3.—A. S., age 7, had several enlarged glands removed last November. The scar of the incision extends from the mastoid process on the right side to a point just above the middle third of that clavicle. The glands were then diagnosed malignant, and microscopically were adeno-sarcoma. After seven months it is found that other glands are similarly affected. There is one about the size of a bean just below the mastoid process, and one a little larger below the clavicle; while a large mass, the size of an orange, fills in the base of the posterior triangle, lying between the border of the scapula behind and the outer half of the clavicle in front. This last does not involve the skin, and is movable in the subjacent tissues.

On the other side of the neck there are also one or two small lumps of similar character. These are all hard and smooth, and show no tendency to break down. The child has recently lost flesh and strength. Mr. Morison points out the importance of recognizing that, clinically, all such chronic enlarged glands are either tuberculous or malignant, and hence that complete removal, wherever possible, is the best treatment.

CONGENITAL CONTRACTION OF THE PALMAR FASCIA RESEMBLING DUPUYTREN'S CONTRACTION.

MR. RUTHERFORD MORISON'S CLINIC. REPORTED BY MR. C. BROUGH.

(*Northumberland and Durham Medical Journal*, July, 1894.)

The etiology of Dupuytren's contraction of the palmar fascia is not yet settled. Formerly, greater stress was laid upon the nature of the patient's occupation and habits, those necessitating mechanical pressure on the palm of the hand and constant flexion of the fingers being considered the common causes of the disease. More recently, greater stress has been laid upon the somewhat vague constitutional states known as the gouty and rheumatic. The ordinary text-books do not refer to the disease as being congenital, and therefore the following case, in which a contraction of the palmar fascia resemoling in many respects Dupuytren's contraction has existed from the time of birth, may not be without interest.

The patient, a female child, age 6, presented herself at Mr. Rutherford Morison's out-patient clinic, in September, 1894. The little and ring fingers of both hands are permanently flexed at the metacarpo-phalangeal and inter-phalangeal joints. When pressed backwards, the little fingers cannot be extended beyond an angle of about 135 degrees with the palmar aspect of the metacarpal bone. The ring fingers can be extended a little further. Full extension is prevented by rigid bands passing from near the front of the metacarpo-phalangeal joints to the bases of the second phalanges. These bands seem to be fixed near the metacarpo-phalangeal joints, and, when stretched do not seem to make the main part of the palmar fascia tense. In the case of the little fingers there appear to be double bands—one arising towards the inner, and the other towards the outer side of the metacarpo-phalangeal joints ; or else, if there be only one band, the borders are more prominent than the central part. In the case of the ring fingers the bands appear to be single. There is no marked creasing or puckering of the skin of the palm, as usually seen in typical cases of Dupuytren's contraction. The flexor tendons are not implicated.

Personal History of Patient.—She is the ninth in a family of eleven children. Her birth was not attended with any difficulty, and no instruments were used. She is the smallest and least well-developed of her family, and has always been considered delicate, although she has not suffered from any definite illnesses. She has not had any of the common diseases of childhood, such as scarlet fever, measles, etc. There are marks on her neck said to have been caused by suppurating glands. The members of her family say that the contraction of her fingers has existed from the time of birth, and they especially refer to the condition having been discussed with a neighbour when the child was two months of age. They further state that there has not been any marked increase in the degree of flexion since birth.

Family History.—The patient's father is a healthy man. There is nothing in his appearance to suggest that he drinks to excess, and he says that he does not do so. He married early in life, and denies that he ever had syphilis. He has not suffered from rheumatism, or any disease suggesting a gouty condition. The patient's mother is a stout, florid woman, whose appearance suggests indulgence in drink. She states that she has always been in good health, and that she has never suffered from rheumatism, nor from any disease of a gouty nature, unless possibly an eczema, which has existed for over two years, be due to that state.

The patient's paternal grandfather, who is living, suffers much from rheumatism, and his fingers are much contracted from that disease, although nothing exists in the nature of a Dupuytren's contraction. The maternal grandmother is living, and in good health. The other grandparents are dead, death being due in one case to cancer, and in the other to an operation for urinary calculus.

Of the brothers and sisters of the patient, the fifth and eighth were killed as the result of an accident; and the eleventh died within a few minutes after its birth. The surviving brothers and sisters are strong and in good health.

There is no history or indication of rheumatism, gout, or tubercle further than above mentioned, and the existence of any syphilis is denied.

NOTES ON OPERATIVE SURGERY.

(*Edinburgh Hospital Reports*, 1894.)

A fuller knowledge has taught us how much the results of operations depend on careful attention to detail, how the neglect of an apparently trivial matter may mar what might otherwise have proved a brilliant success, and how frequently a patient's welfare is dependent entirely on the individuality of his medical attendant. The recognition of such facts adds materially to the interest and importance of surgical work, but cannot fail to add to the anxieties of the surgeon. He must, however, accept the position, as it is only by increasing his sense of responsibility that further improvement can be looked for.

The conviction has been forced upon me, that a majority of the ill results of operations are due to some omission in the preparation of the patient, to the choice of an unsuitable operation, or to some accident in the course of it; and the object of this paper is to illustrate, by examples drawn from my own experience, how some mistakes may be made, and how others may be avoided.

The three great causes of death general to all operations in surgery are—(1) Sepsis; (2) Hæmorrhage; and (3) Shock.

It may fairly be stated that our present methods, skilfully applied, are efficient in the prevention of all of these, but that of the many remedies recommended for the treatment of any of them none is reliable.

Sepsis.

So much has been said and written on this subject during the past twenty years, that all surgeons are familiar with some method or other, more or less efficient, based on or influenced by the essential antiseptic principle—cleanliness—by which the best, or good, results in wound treatment may be obtained in straightforward cases.

In exceptional instances, however, some special detail may be more likely than another, or absolutely necessary, to insure success.

In the preparation of cases, for example, in which the part to be operated upon has been bathed in fœtid discharges, as for instance in cases of fungating breast cancer and ulcerated limbs, special precautions must be taken to secure a surgically clean condition of the surrounding skin. If, in addition to ordinary measures, its sodden epidermis is not scraped away, wound infection from this source will frequently follow the operation. I have seen this happen many times.

Where operations have to be performed on tissues already septic, riddled perhaps with putrid sinuses, or connected with a foul wound, the special preparation may be the most important part of the operation. Where putrid sinuses can be dissected out, this should be done as carefully as if they were foci of malignant disease. When this is not safe, vigorous scraping may be substituted, though the possibility of opening into joints in bone cases, into large vessels in the soft parts, both of which accidents I have seen during the use of the sharp spoon, have to be borne in mind as a danger to be avoided.

In this class of case, or in any other in which pus has gained access to the wound, frequent irrigation during the operation is both useful and necessary, though, when the operation is completed, the remaining lotion, if a powerful germicide has been used, should be washed away with a weak one, for all antiseptics are to be regarded as more or less damaging to the tissues, and only to be used as the lesser of two evils.

In the performance of certain operations, some empirical detail may be necessary, or a special operation ought to be selected; for example—

A man, age 23, was admitted to the Royal Infirmary, Newcastle, with an empyema opened six months before I saw him. Fœtid pus in large quantities escaped from a sinus in his back when he coughed. He was much emaciated, and suffering from hectic fever with night sweats. I performed Estlander's operation in June, 1893, removing portions of six ribs and freely exposed a much-changed pleural cavity lined with a thick tough layer of purulent lymph, and containing about 16 oz. of stinking pus. The importance of avoiding septic contamination of the wound was obvious, and with this object I swabbed the whole pleural cavity with tincture of iodine, and packed it loosely with iodoform gauze. The patient's immediate recovery from the operation was most satisfactory, and on the day after he

was bright and cheerful; but six days afterwards he died, with all the symptoms of acute septicæmia.

There are two methods by which this result might have been avoided, for I have since learnt that such cases may be treated with every prospect of success: (1) If the exposed raw surface be brushed over with a solution of chloride of zinc, 40 gr. to 1 oz.; or (2) If the ribs to be resected are exposed and excised at a part of the chest removed from the putrid opening, and without wounding the pleura, as in a case reported recently in the *Edinburgh Medical Journal* by Dr. James, and operated upon by Dr. Macgillivray.

Since reading the notes of this latter case I have performed one such operation on a man, age 55, in whom the large wound made anteriorly healed by first intention, under one dressing; and though the putrid sinus behind, enlarged for thorough drainage, still remains unhealed, the ultimate result, judging from the small amount of discharge and the excellent general condition of the patient, promises to be a success.

In *abdominal operations* the most important matter is to avoid general septic peritonitis, and to attain this the chief function of the surgeon is to keep the peritoneal cavity clean for the first forty-eight hours.

A localized peritonitis, or a contamination of the wound, are of second-rate importance compared with this; although it should not be forgotten that, in addition to the ordinary disadvantages of an unhealthy wound, the special one of ventral hernia is likely to follow suppuration. Skilful sponge-packing during the operation, and of gauze-packing and drainage after the operation, are perhaps the most striking aids to successful abdominal surgery.

The cases to be feared are those in which pus may be introduced into the general peritoneal cavity, for though the peritoneum will deal successfully with a considerable quantity of ordinary dirt, I have seen the introduction of even a small quantity of pus produce disastrous results.

A suppurating ovarian tumour is the most unfavourable case for ovariotomy, and no operator who is unfortunate enough to meet with and attack many of such cases will be able to boast of his percentage of success.

Though the treatment of cases in which septic infection has been fully established is usually unsatisfactory, exceptions are frequent enough to encourage the adoption of vigorous methods in suitable cases, such as the following:—

A case of spreading gangrene in the arm was under my care, for which amputation at the shoulder-joint was performed. Two days after the operation a red blush on the skin of the chest, with crepitation in and around

the pectoral muscles, proved that the disease had invaded the structures covering the chest wall. The patient was immediately anæsthetized, and a large flap of skin was turned up over the infected area. All the sodden and discoloured areolar tissue over, under, and about the pectoral muscles was dissected away. The raw surface left was freely swabbed with carbolic acid and spirit lotion, 1 in 5. The wound was left open, and irrigated every half-hour with iodine lotion.

Three days later a similar condition appeared over the back, and the patient now looked almost hopelessly ill.

Chloroform was again administered, and the parts about the latissimus dorsi and scapula treated in the same manner as those in front.

From this time the disease made no further progress, and the patient made a satisfactory recovery.

The following is a case illustrating the danger of hæmorrhage in chronic septicæmia, for the patient died of acute sepsis after the operation.

A man, age 63, of very intemperate habits, was under my care in the Infirmary at Newcastle with a *diffuse* gangrenous cellulitis of the arm. Amputation at the shoulder joint was undertaken, as this alone offered any chance of recovery. An Esmarch's band was applied circularly in the axilla and over the clavicle, and retained in this position by straps on the chest and back. The flaps had to be cut very short in consequence of the encroachments of the disease, and at the moment of disarticulation of the shoulder the axillary artery retracted and disappeared under the tourniquet, Before the vessel could be secured the patient had lost about 10 oz. of blood, and a change for the worse in his condition was at once apparent, though he soon responded to treatment.

After his return to bed his temperature quickly ran up, he became wildly delirious, sweated profusely, and died seven hours after the operation.

Hæmorrhage.

The success of the larger and slower operations of the present day is due in a great measure to the limited quantity of blood lost during their performance. The universal favour shown to the varieties of hæmostatic forceps is a practical recognition of this fact, though I do not think that hæmostasis meets with the appreciation it deserves.*

Loss of blood alone, it is true, rarely kills, but it is a powerful aid in the development of acute septicæmia, and a fatal addition to severe shock.

In most cases of accident several circumstances contribute to bring about death, but loss of blood is by far the most important. I believe, for example, that in an uncomplicated primary amputation the prognosis is almost determined by a knowledge of the amount of blood lost since the accident.

The importance I attach to the prevention of blood loss during

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* *This is still true.*

severe operations will be emphasized by the relation of two recent cases :—

Case 1.—Mrs. P., age 63.

History.—Breast removed for cancer on July 16, 1891. In February, 1892, a nodule of skin on the chest wall, and the axillary glands and fat excised. In May, 1892, a nodule in the old breast cicatrix necessitated another operation. In May, 1893, the patient consulted me in the following condition :—

There were four subcutaneous nodules, of size varying from a five-shilling to a one-shilling piece, on the chest wall between the axillary folds, and a sausage-shaped mass of growth extending down the arm in the neighbourhood of the axillary vessels and nerves. There had been pain down the arm, and there was swelling of the forearm and hand.

Seeing that the disease had remained so long localized, and believing that her arm, if left, would in a few months be only a painful encumbrance, I advised a further attempt to effect a complete removal of the growth, and on May 30 performed the following operation :—

1. Ligature of the third part of the subclavian artery.

2. The formation and reflection of a large broad parallelogram-shaped muscular flap from the anterior outer and posterior surface of the upper arm, reaching down to the elbow.

3. Disarticulation at the shoulder joint and removal of the arm.

4. Excision of a broad parallelogram-shaped surface on the chest wall down to the ribs, including the malignant nodules, a wide area of skin and muscle round, and all that remained of the axilla.

5. Covering the gap in the chest wall by the flap from the upper arm, and fixing it by sutures, thus leaving no raw surface.

The patient did not lose more than between 2 and 3 oz. of blood, and she returned home in a fortnight, having made an uneventful recovery, and the wound having healed by first intention.*

Case 2.—Mr. E. J. C., age 40 ; admitted to the Newcastle Royal Infirmary, under my care, on June 14, 1893, with a large fungating growth in his mouth, springing from the left side of the lower jaw.

Present Condition.—The lower part of the left cheek is enormously swollen by a firm growth connected with the lower jaw. The skin over the tumour is red, thick, and infiltrated. The submaxillary lymphatic glands are enlarged and attached to this tumour. The floor of the mouth and anterior pillar of the fauces are implicated in the ulceration, which covers the oral surface of the tumour.

His night temperature during the six days he was in the Infirmary before the operation reached from 100° to 101·6°, in spite of frequent antiseptic irrigation. I performed the following operation, in successive steps, June 20, 1893 :—

1. The formation and reflection of a large skin flap from the left side of the neck, by an incision reaching from the lobule of the ear, and running parallel with the line of the lower jaw, to below the point of the chin ; from this point down the middle line of the neck to the lower border of the thyroid cartilage ; and from this point directly backwards to the centre of the sternomastoid muscle.

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* *Interscapulo-thoracic amputation would have been a better operation, but no one had done it then.*

2. Ligature of the external carotid artery between the superior thyroid and the lingual branches.

3. The isolation of the diseased skin of the cheek by two incisions, one reaching from the angle of the mouth diectly downwards to join the incision already made, the other from the angle of the mouth over the cheek to immediately below the lobule of the ear.

4. Division of the lower jaw in the middle line, and removal of the whole disease in one piece after disarticulation at the temporo-maxillary articulation.

5. Completion of the operation by plugging the cavity with iodoform gauze, covering the gap in the face by the flap from the neck, and suturing it in position. Not more than 5 oz. of blood was lost, and the patient made an easy recovery, the highest temperature recorded being 100·6° on the third day after the operation.

The growth proved, on microscopic examination, to be an epithelioma.*

The treatment of hæmorrhage by the injection of normal saline into veins, or colon, or tissues, cannot at the present date be neglected, for records of results show that in some cases the effects have been little short of marvellous. I regret to say that my cases do not lead me now to indulge in too great expectations from this measure.

Shock.

Pure shock should seldom result in death. Chiefly because of the recognition of this truth, as I imagine, fewer cases of shock are allowed to die; and since more distinct border lines have been drawn between the parts played by sepsis, hæmorrhage, and shock, the effects of the latter have come to be better recognized and more fully studied.

We now know in a rough sort of way what type of patient is most likely to suffer from shock, what class of operation is most conducive to it, what methods are most useful in its prevention; and in the treatment we are at all events more hopeful than in cases of sepsis and hæmorrhage. A special predisposition to shock is observed in children, some nervous patients, pigmented women, or persons suffering from intestinal obstruction or abdominal cancer, and these are bad subjects for severe and prolonged operations.

Old people quite seldom suffer from the ordinary symptoms of acute shock, and often recover in a deceptive degree from the immediate effects of a severe and prolonged operation. The recovery, however, is apt to be incomplete, and death in such cases is likely to occur before the end of the fourth day.

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* *Cases* 1 *and* 2 *suggest what was then a new principle in surgery, viz., ligature of the vessels of supply of the part to be excised at the commencement of the operation.*

In the prevention of shock, warmth during and after the operation is the most valuable aid. Half an hour before the performance of a major operation, I have my patient comfortably arranged on the operating table, with the limbs wrapped in blankets, or bandaged in cotton-wool, and the body covered by blankets and surrounded by hot bottles wrapped in thick flannel.

A brandy-and-milk and beef-tea enema is administered to nervous and debilitated subjects on the table, and is repeated when necessary during the course of a severe or protracted operation. Prolonged anæsthesia contributes to the production of shock, so that all likely and unlikely instruments should be prepared, ready for use if required, before the anæsthetic is commenced; and the operation should be completed as rapidly as is compatible with thoroughness, for speed in operating—perhaps insufficiently cultivated by some surgeons—is a great aid to satisfactory recovery in most cases, all-important in some. A delicately performed operation is followed by less shock than one not so carefully carried out, for though a patient may not be conscious of rough handling, to tear tissues with the fingers or a blunt director which should have been divided by a sharp knife, or to attempt to perform an impossible manipulation through too small an opening, is to increase to a certainty the degree of shock.*

In the treatment of shock, heat still occupies the foremost place. Elevation of the foot of the bed, rubbing the face of the patient with a dry rough towel, swabbing the mouth and pharynx with a sponge on forceps wrung out of raw spirit, and a stimulating enema, are the ordinary means employed in the more severe forms. An enema of one pint of hot (100° F.) saline lotion (one drachm of table salt to one pint of water), and 1 to 3 oz. of whisky, has a good effect.

Example.—A young woman, 19 years of age, half of whose lower jaw I excised in the Infirmary for a very large and vascular sarcoma, was much reduced by shock and hæmorrhage when put to bed on the completion of the operation. In a quarter of an hour after rectal injection of 2 oz. of whisky and a pint of hot normal saline, her condition was notably improved, and she recovered without further drawback.

The rectal injection in such cases may be repeated when necessary, and in most cases the colon may be relied on to dispose of from 2 to 4 pints, if the injection is made slowly and at intervals.†

In several cases I have used intravenous injections of the normal

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* *This has lately been emphasized by Crile, but is still too often forgotten.*

† *Proctoclysis, as a modification of this treatment is called now, would allow of* 20 *to* 40 *pints.*

saline, and have had two recoveries (amputation), in apparently hopeless cases, follow.

The immediate good effects of the injection are usually quickly evident, but the improvement is seldom maintained for long, and the injection may require to be repeated. That this can be done with ultimate impunity remains to my mind yet to be proved.

The largest quantity I have injected was in the case of a middle-aged man who had both legs crushed off at the knee by a railway waggon, and who, when I first saw him, was unconscious, and suffering from profound shock.

One pint of normal saline was injected into his femoral vein,* and improvement followed. A double thigh-amputation was then performed, and the pulse failed on several occasions. Each time this occurred, saline was injected till the pulse regained power. The operations occupied one hour, and on their completion the patient appeared to be better than at the beginning. In all two quarts of normal saline were injected into his veins. He, however, died four hours after the operation.

Intravenous injection of normal saline in cases of pure shock has been recently tried with success by Mr. Mayo Robson, of Leeds.

How many of the deaths placed to the credit of shock are due to the accompanying hæmorrhage and consequent sepsis? The question can, I think, be answered by leaving the minority to shock.†

General dangers are less impressive than particular ones, and a relation of some difficulties I have experienced in special cases may serve more clearly to convey the meaning of my paper.

A good light, and the choice of an operation which can be done steadily, and every step of which can be clearly seen and fully understood, are, all will allow, the most important guarantees of a successful result; nevertheless, the sight of a brilliantly performed lateral lithotomy, of an amputation at the hip-joint done in a few seconds, or of a hernial sac opened by the first skilful sweep of a bistoury, fascinates us with the art of surgery.

The excision of a large mass of deep cervical glands seems perhaps one of the most difficult of the ordinary operations. Liberal skin incisions with transverse division of the sternomastoid, allowing a free exposure of the mass, convert a difficult into an easy case. Division of the sternomastoid has been objected to, on the ground that wry neck results, and this may be so if inflammation and suppuration occur, but no such or any bad effect has followed free division with

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* *This has been recently written up as a new method.*

† *And I still think so.*

subsequent suture in several cases in which I have done this in preference to tearing or bruising the muscles with retractors.*

Excision of the tongue with scissors, by Whitehead's method, when performed on a patient with a large elastic mouth, gagged thoroughly open, and a freely movable tongue with limited disease, is perhaps, from its simplicity and freedom from risk, a nearly perfect surgical procedure. I have done it several times, and was much impressed with its value, when an old woman, 82 years of age, was sent to the Royal Infirmary with epithelioma of the right side of her tongue.

She was in good health and active for her years. The tongue was fixed to the floor of the mouth upon the right side, otherwise the case was a most favourable one for operation. I selected Whitehead's method as being the most rapidly performed, attended by least shock, and followed by the shortest confinement to bed, and the patient was put under chloroform.

All seemed well until one lingual artery was divided, when, owing to the fixity of the tongue and consequent difficulty in drawing it forward, some trouble was experienced in securing the vessel, a large mouthful of blood was drawn into the trachea and bronchi, causing respiratory difficulty, and, though the operation was completed without further trouble, the patient died five hours after, never having emptied her lungs of the inspired blood.

I much regretted this result, for I felt that such an operation as Syme's, in which the parts are freely exposed and every step of the operation can be clearly seen, and all chance of accident thereby eliminated, should have been selected in this case.†

Breast Cancer.—In several cases where the axillary glands have been torn out between the surgeon's finger and thumb, I have seen alarming bleeding occur at the bottom of a deep wound from the axillary vein or one of its larger branches. If both pectoral muscles be divided, the axilla is fully exposed, and if the vein is first carefully cleansed on the outer side, the whole fat and glands can be safely dissected out in one uninjured mass.‡

The use of the arm in my cases has been as soon recovered after this operation as after the older one, for the muscles were placed in their normal position, and the division remedied by buried sutures.

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* *The division of muscle nerves is much more serious in result than the division of muscle fibres.*

† *Since Butlin published his method of preliminary laryngotomy I have always done this before excising the tongue.*

‡ *Before the new operation of removal of both pectoral muscles became the practice this was a valuable aid.*

Perineal section is occasionally necessary in bad cases of stricture, in which the ordinary methods have been fairly tried or failed. To find the proximal side of the urethra without a guide may be difficult, and I have seen, more than once, disastrous results follow a prolonged and vigorous search.

In such cases, I believe that the immediate and remote results are improved by making a suprapubic opening in the bladder, and passing a staff from the vesical orifice along the urethra to the block in the perineum, for I have seen this operation performed five times, and on each occasion with such success that every patient made an uneventful recovery.*

In kidney surgery the ordinary oblique lumbar incision is, in the majority of instances, most unsatisfactory. Except for cases requiring only nephrotomy, the incision should be of such extent as to allow the surgeon's hand free access to the kidney. In cases of stone in the kidney, much time will be saved, and damage to the tissues in the end averted, by drawing the organ out on to the loin, opening it on its convexity, and exploring it with the finger. Mr. Morris says that no exploration of the kidney for stone can be considered complete till this has been done, but reserves this step till the last and for difficult cases. I would have it applied to all.

In a recent case, by this method I discovered and removed with success a stone impacted 3 in. down the ureter, which would certainly have eluded a less thorough search.

After having seen a considerable number of kidney operations, I am persuaded that here, as elsewhere, the combined operation, in spite of its apparent magnitude, is safer than the less formidable looking procedure usually adopted.

The best incision I believe to be one of T-shape, the vertical part opening the abdomen in the linea semilunaris, and the horizontal portion extending round to the back between the ribs and the crest of the ilium.

From the vertical one the opposite kidney may be explored, and the diagnosis of enlarged kidney, not always easy, especially when the swelling is on the right side, be confirmed; from the horizontal one the wound may be most effectually drained, and the combined effect allows of the most free manipulation.†

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* *The first time I knew of this, or saw it done, was, on my recommendation, by one of my colleagues, who had failed to find the urethral opening by perineal section. It is a life-saving measure now.*

† *Since the introduction of the cystoscope I use the transverse incision only.*

In septic cases, soiling of the peritoneum can be avoided by sponge-packing, and irrigation during the operation, and peritoneal suture with gauze-packing, and free drainage after it. Also, if it be remembered that the peritoneum in a number of difficult cases is unintentionally wounded, and that this result must then be regarded as a serious complication of the lumbar operation, the objections to the incisions I have suggested will be recognized as more theoretical than practical.

Suprapubic cystotomy may be much simplified by keeping a sharply curved staff in the bladder during the operation. As soon as the recti muscles are separated, the staff is drawn firmly down against the pubis, and its handle depressed between the thighs, when the bladder is protruded on the point of the staff, caught on either side with clip forceps, and opened without risk of losing it or pushing it before the finger, either of which accidents may happen.*

Tracheotomy in children is occasionally one of the most unsatisfactory and difficult operations in surgery, but how often does this arise from forgetting that the first and most important stage is to ' clean ' the front of the trachea, a not very difficult dissection.

Amputations.—Before concluding, I must express my sympathy for the poor student who is obliged to get up the subject of amputations from a surgical text-book; but this is not the worst aspect of the case, for that many patients are the victims of classical amputations I am quite sure. What could be more unfortunate for a patient with a much damaged thumb than to have it treated by a young practitioner skilled at, and anxious to display his skill in, amputation by the transfixion method at the metacarpo-phalangeal joint?

Surely it is time to teach such an operation, in the class of operative surgery, only as an ' evil example.'

I have seen many bad stumps due to a bungled operation, and it is rare to see a beginner make good flaps; yet a major amputation is one of the easiest operations in surgery, and one that can be well performed by any practitioner who will take care, and has been taught properly how to do it.

The methods of amputation may, I think, be reduced to three†:—

1. Those through the continuity of the limb, when the ideal is

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* *The method by which I perform this operation now is*: (1) *Pass catheter*; (2) *Incision in linea alba*; (3) *Inject bladder (with a finger in the bottom of the wound it is easy to feel the bladder filling up)*; (4) *Expose anterior wall of bladder and push up peritoneum*; (5) *Open bladder transversely.*

† *Interscapulo-thoracic amputation must now be added.*

equal antero-posterior flaps of square shape, and of length equal to one and a half diameters of the limb. I have done many amputations by this method, using an aniline pencil or nitrate of silver to map out the flaps, and a short scalpel to do all the cutting, and have never seen the cicatrix adhere to the bone, lie over the centre of the stump, or cause any other of the troubles described in surgical works.

2. Those at the hip or shoulder-joints, both of which, I believe, are best performed by a circular amputation, of the thigh or arm about the middle, and disarticulation of the hip or shoulder through a long external incision.

3. Syme's amputation at the ankle, for in this position the rule to leave as much as possible of the limb is not always the best to follow.

In doing an amputation for injury, I have taught for the last six years that the points to be remembered are :—

1. To sacrifice no more of the limb than is absolutely necessary to get flaps sufficient to secure a stump well covered without tension.

2. To make skin flaps, taking special care not to sever the subcutaneous tissue by cutting away from the skin, and to divide the muscles circularly.

3. When called upon to do such an operation, not to read up methods in a text-book, nor, armed with knives a foot long, resolve to ' whip off ' the limb in a few seconds.

4. That so long as flaps are ample, it matters little whether they are anterior, posterior, or lateral, whether there are one or two, or whether they be equal or unequal in length.

5. That care in preparing for operation, and in detail during the operation, is amply repaid by the saving of pain and danger to the patient, and anxiety and trouble to the surgeon.

6. That an amputation wound ought to heal without constitutional disturbance or even pain, without drainage, and under one dressing put on at the time of the operation.*

DEMONSTRATION OF A NEW METHOD OF TREPHINING.

(*Northumberland and Durham Medical Journal*, 1895, p. 40.)

Mr. Rutherford Morison, along with Mr. Markham, gave a demonstration of a new method of trephining, with the dental engine, and bits specially devised by Mr. Markham. They held that the operation performed with this instrument could be done more rapidly and with greater ease by this than by any other method, and that it would supplant the other older measures.

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* *That they will regularly do so I have abundantly proved. For a further advance see my book, " An Introduction to Surgery," where cases operated on for gangrene are quoted.*

PRIMARY SYPHILITIC SORES SITUATED ELSEWHERE THAN ON THE GENITAL ORGANS.

By C. A. Brough, M.B., L.R.C.P.Ed. From Mr. Morison's Out-Patient Clinic.

(*Northumberland and Durham Medical Journal*, 1895, p. 188).

Recognition of the existence of primary syphilitic sores elsewhere than on the genital organs is a matter of great practical importance; and as the subject is not very fully referred to in ordinary text-books, it has not been considered out of place to report the following cases which presented themselves at Mr. Rutherford Morison's clinique, and were there diagnosed as cases of syphilis in which the primary sore was on a part other than the genital organs. In all cases of this kind, however, the statements of patients are almost necessarily unreliable, and even when every care has been used to ascertain the facts, the mind is never quite free from doubt as to whether the true condition of affairs has been discovered.

Case 1.—N. S., age 18, servant at a large hotel at a watering-place. Patient says that for some time she had been associating with a commercial traveller, and occasionally went out walking with him. She knew that he had sores at the corners of his mouth, and also upon his lips, and that he had an eruption upon one of his arms; and some of her older companions said that they thought he had "the bad disease," but she did not believe this, and thought the sores were due to another cause. He kissed her frequently.

On the morning of August 3 of last year patient noticed a pink or red flush on her left cheek, about three-quarters of an inch above the angle of the mouth. The pink area was about the size of a threepenny piece, and was slightly raised above the level of the cheek. There was no pimple in this area, and there was no itching. The patch remained unchanged for a week or so, and patient thought it would fade away, but, instead of so doing, the skin over it began to peel off. This skin came away in little dry scales of a white colour. After the whole of the skin had been shed, a red, fleshy-looking surface was exposed, but this was not moist. A little later a small pimple or top formed on the fleshy surface. This pimple got rubbed off when patient was washing her face; it re-formed from time to time, and from time to time was rubbed off. From the site of the ulcer thus formed matter was constantly discharged during the day, but a crust used to form upon it at night. The ulcer seemed to grow deeper until what looked like a deep hole into the cheek was formed. Patient never felt any pain or hardness about the sore or patch. The ulcer continued to increase in size and to discharge purulent matter until September 17, when a firm crust formed over it. At this time the ulcer was about the size of a sixpenny piece. At the end of a week the firm crust was knocked off, and a raw granulating surface exposed, but no matter or discharge, except a little blood, came from it. The patient at this time went to a medical man, and was under treatment until October 9, when she came to the Royal Infirmary. She says that she did not go to the medical man on account of the sore, but because she had been suffering from severe headache for about three weeks.

This affected her during both day and night, and at times prevented her from sleeping. It varied much in severity from time to time, and she was unable to read, as reading increased its intensity. She had also become very weak and languid, and unable to do any work.

When she came to the Infirmary the patient was found to be anæmic. There was a sore about the size of a shilling on the cheek, covered by a scab, and around this sore there was an area of redness. The scab formed a thick, dark and irregular crust. Some induration or stiffening of the tissues around the sore existed, for on pressing them between the finger and thumb they did not bend or form folds. No pain accompanied the sore. The glands on the left side of the jaw and neck were swollen and hard, but they were not tender on pressure. There was a well-marked rash on the chest, back, and legs, the inner aspects of the legs over the tibiæ showing it most conspicuously. The rash on the trunk was papular; that on the legs consisted of roseolar patches, without papules. The patient was also suffering from sore throat, and experienced some pain and difficulty in swallowing. She stated that her lips had been sore, but no sores were observed.

On examination, the genital organs appeared to be quite free from disease. There was no trace of any sore, and patient stated very positively that there never had been any.

The patient had been trying to account to herself in various ways for the appearance of the sore on her face, and among other suggestions she said she thought she might have poisoned her cheek by touching it with her hand just after counting over £20 in copper coin, which she had done on the day before the mark first appeared on her cheek.

The case has yielded to ordinary syphilitic treatment, and nothing but a slight pinkish discoloration remains on the cheek.

Case 2.—Mrs. B., age 43; married woman. Has been married twice; the second marriage took place a year before she came to the Infirmary. About five months before attending she says that a sore appeared on the inner aspect of her upper lip, near the middle line. To use her own words, the lip "festered white." The sore was very painful; it continued in a practically unchanged condition for about three months, and then disappeared. About ten days after the appearance of the sore on her lip, her throat became affected. It was very painful, especially when she attempted to open her mouth or to eat. The pain was most marked below her ears, and a swelling, about the size of a walnut, appeared below the angle of the left jaw, but there was no swelling on the right side. She examined her throat in a looking-glass and thought that it was very red. She says that she had on several occasions before suffered from a sore mouth and severe sore throat, and did not, therefore, attach so much importance to her condition as she might otherwise have done. She had no rash of any kind upon her body or limbs at this time. About three months after her lip became sore, she was handling some hawthorn, and a small thorn or splinter ran into the pulp of the index finger of her right hand. For about a month, the front of the finger felt tender, and then the back of it began to feel tender also—this tenderness was most marked close to the outer border of the root of the nail. Then a swelling appeared around the nail, a slight discharge also began to come away from where the edge of the nail joined the soft parts. At first this discharge was small in quantity, thin and yellowish; but later it increased in quantity and became thicker and redder in colour. There was some pain in the finger; but pain was never a marked feature.

The patient came to the Infirmary in October last. Before coming

there she had been under treatment at the Norwich Infirmary. When first seen, the patient had well-marked mucous patches upon her fauces and gums ; but there was no sore on the upper lip, at the site of the original one described by her. There was also a well-marked roseolar and papular eruption upon her chest and abdomen. The right index finger was swollen and red near the outer side of the nail, and at the junction of the nail and soft parts there was a dark yellow collection, like granulation tissue, from near which a small amount of purulent fluid escaped; but the quantity of the discharge was not increased by pressure, and pressure was not painful. The epitrochlear gland was enlarged. The genital organs did not show traces of any lesion, and the patient was very positive in her statements that there had never been any sore upon or unusual discharge from her genitals since her last marriage.

This case has yielded to anti-syphilitic treatment, the sore on the finger rapidly disappearing upon being dressed with black wash.

Doubt arises in this case as to the site of the original lesion. Assuming that it was not upon the genital organs, then the history is consistent with its existence either upon the upper lip or the index finger. Mr. Morison was of opinion that the sore on the finger was the primary one, and he thought that the appearance of the finger was characteristic. The sore on the lip he thought to be due to other causes, such as may have occasioned prior attacks such as referred to by the patient.

Case 3.—W. K., aged 49, time-keeper. This patient stated that about five weeks before coming to the Infirmary he had connection with a woman, who, he has reason to belive, was suffering from syphilis. Between three and four weeks from the time that he was with her, he observed two small sores upon his penis, just behind the *corona glandis*, and another upon his forehead near the left external angular process of the frontal bone, and about half an inch above the outer end of the eyebrow. This sore on the forehead began as a pimple, then it broke, and some matter came away from it. Patient recollected that at the time when he was with the woman he had received a scratch upon the forehead from a pin, and that he had rubbed it with his fingers. The sore upon the forehead continued to increase in size, and he went to a chemist for treatment. Finally, in May last, he came to this Infirmary. When first seen, two small sores were found upon the penis in the position mentioned. There was little discharge from them, and they showed marked induration. On the left side of the forehead, near the external angular process and encroaching upon the eyebrow, there was a large sore. This sore was of about the size of a florin ; it was raised above the surrounding parts to the extent of about the thickness of a florin, and its edges were very abrupt. The surface of the sore was of a bright pinkish-red colour, and covered with a discharge like thin white of egg, and resembled somewhat a normal moist mucous surface, except at the centre, where there was an opaque whitish patch of epithelium about the size of a threepenny piece. There was no sign of scabbing, and the induration, if any, was slight. The sore was not painful. There were some enlarged glands near the zygoma (pre-auricular).

Anti-syphilitic treatment was adopted, and the sores have been rapidly diminishing.

THIERSCH GRAFTS.

(*Northumberland and Durham Medical Journal*, 1895, p. 98.)

Mr. Morison exhibited two patients illustrating the advantages of Thiersch grafting in certain cases.

CASE 1.—A man of 54 years of age, who was operated on fifteen months ago for rodent ulcer of fourteen years' duration. The ulcer occupied the temporal region of the left side, and extended from the auricle behind, which it involved, to the external angular process in front, and from the zygoma below to the temporal ridge above. It had resisted a large number of attempts made for its removal, and was making steady progress. An incision was made a quarter of an inch outside of the edge of the ulcer all round, and the whole ulcer, with the involved skin, freely removed down to the temporal fascia. A raw area was left of the size of the palm of a large hand, which, it was obvious, could never heal by granulation. The whole of the raw area was covered by portions of skin varying in size from a sixpenny piece to a penny piece, removed from the patient's thighs, and traces of the resulting mosaic could still be seen. The wound healed practically by first intention, there was not the least contraction, and the deformity was trifling.

CASE 2.—A man of 35 years, with sarcoma of the leg involving the skin, the periosteum of the tibia, and the sheaths of the tendons. As large a skin gap was left as in the former case, and the tibia, with the extensor tendons, lay bare at the bottom of the wound. The gap was partly filled in by a flap turned down from the calf, but the bulk of it was covered by skin grafts taken from the patient's thigh. The wound is now entirely healed, and it is interesting to observe that the grafts laid on the bare bone and tendons have retained their vitality.

NOTES OF A CASE OF SEROUS EFFUSION INTO THE PLEURA TREATED BY FREE INCISION AND DRAINAGE AFTER THE FAILURE OF REPEATED TAPPINGS.

(*British Medical Journal*, July, 1895, p. 75.)

Dr. Samuel West's report, in the *British Medical Journal* of April 27, 1895, of a case of serous effusion into the pleura treated successfully by free incision after the failure of repeated tapping, and the interest his paper excited when read at the Medical Society of London, induce me to send the notes of a case very similar to his. My case occurred in 1882, and was recorded in a thesis presented by me to the University of Edinburgh, from which I have made the following extract :—

E. A. L., age 23, residing at West Hartlepool, was first seen on Feb. 7, 1882. The patient, a thin, pale, delicate-looking little woman, was unable to lie down because of difficulty in breathing. Her feet were swollen. The temperature was 100·6° F. ; the pulse was 96, when she was lying quiet, but ran up to 120 when she was disturbed. In the abdomen a large apparently multilocular ovarian tumour was discovered ; and the right chest was found to be dull all over on percussion. Breath sounds, vocal resonance, and vocal fremitus were absent.

The abdominal swelling had commenced with what from her description was an attack of peritonitis seven months earlier, and three months afterwards her abdomen was tapped by her medical attendant to relieve difficulty in breathing. A large but unknown quantity of clear fluid was removed by the tapping with some relief, but the abdomen rapidly refilled.

On Feb. 11 I aspirated the right pleura and withdrew the needle when 25 oz. of clear fluid had escaped. For two nights she was relieved; then the dyspnœa returned. On Feb. 14 I aspirated again, slowly withdrawing through a small needle 4½ pints of fluid. The chest rapidly refilled, and by Feb. 28 the dyspnœa had returned and the right chest appeared to be full again. I then decided to try if I could gain on the fluid by repeated small aspirations, and removed 1 pint of fluid. On March 2 a second pint was aspirated; on March 6 a third pint; and on March 10 a fourth pint. On March 12 the chest seemed to be as full as ever, and the patient was steadily losing ground from fever, night sweats, the frequent tappings, and inability to eat.

On March 14, 1882, with the antiseptic precautions practised at that time, under the carbolic spray, and without any anæsthetic, I made a free incision into the pleural cavity in the middle axillary line, and inserted 3 in. of large-bored india-rubber drainage tube. Fluid rushed from the tube during its escape. On several occasions, fearing that so sudden an emptying of the cavity might cause serious disturbance, I restrained the flow. The patient, however, only felt relief, and made no complaint of pain or discomfort, except a weak sensation. Large antiseptic dressings (carbolic gauze) were applied, but in spite of frequent change and liberal use of gauze the dressings were continually soaked during the first five days. For the first two days the tongue was dry and the temperature 100° at night, otherwise there was no constitutional disturbance. On the sixth day after drainage the discharge suddenly ceased, and the dressing was for the first time found to be almost dry. From the sudden cessation of discharge I feared the tube might be blocked, but on removing it I found its lumen patent. A director passed into the pleural cavity also showed that it was empty. The percussion note at this time was tympanitic all over; there was a complete pneumothorax. The tube was introduced and retained for two days longer, when it was finally removed, as there was no discharge from it. The patient steadily gained ground for a fortnight, at the end of which there were no physical signs of any chest derangement, except slight impairment of the percussion note and some weakness of the breath sounds.

The abdominal swelling now began to be troublesome again, and a week later I performed ovariotomy. The operation was a difficult and severe one from dense adhesions to the parietes in the left lumbar region, and the patient died half an hour after being put into bed. No post-mortem examination could be obtained.

Remarks.—Before performing this operation I had seen Sir Joseph Lister open and drain knee-joints distended by fluid with success. This experience gave me confidence, and the result justified the means, for I have as little doubt as it is possible to have in the absence of a post-mortem examination, that my patient's chest was well when she died. I have since always thought that an aseptic opening into the pleura was free from danger, that the proper surgical treatment of pleural effusions which resisted a moderate amount of tapping, was to have them incised, drained, and dressed by a careful surgeon; and my strong impression is that no present-day surgeon would be found unwilling to do as was done in Dr. West's case or my own.

A NEW OPERATION FOR THE CURE OF VESICO-VAGINAL FISTULA.

(*Northumberland and Durham Medical Journal*, 1895, p. 213.)

So far as I know, two operations are performed for the cure of vesico-vaginal fistula.

1. The ordinary operation.

2. Mr. Lawson Tait's operation, in which the edges of the fistula are split all round, the bladder edges turned forward, and the vaginal edges backwards, and the raw surfaces between the two brought into apposition by sutures limited to the freshened areas.

The description of both operations is as simple as the execution of them is difficult.

The chief risk of both is that one or more sutures may be left projecting into the bladder; and there are several objections to either. That these operations frequently fail to secure union after a first attempt is too well known, and the reasons for this are not far to seek. To bring linear surfaces into such accurate contact that no leakage can occur is too much to expect from an ordinary operator; and, if this difficulty be overcome, the sutures are apt to cause trouble from the dragging to which they are subjected by a normally tense vaginal wall. Then the thick, unyielding vaginal wall and the depth of the bladder wound make satisfactory closure of the fistula in the bladder without perforation almost impossible, and some leakage into the wound from the bladder side is consequently more than likely to occur.

My notion is, that to operate in these cases with the greatest probability of success, the same principle must be applied as has revolutionized treatment of intestinal fistula.

The opening in the bladder must, like that in the intestine, be freely exposed, and in the former as in the latter, complete closure of the visceral opening should be regarded as the key to a successful result.

There are two anatomical points which may be noticed as bearing upon my operation:—

1. That the thick-walled vagina is separated from the thin-walled bladder by a layer of cellular tissue, usually so friable that a finger suffices to separate the one from the other.

2. That the blood supply comes to the vaginal walls from every quarter, so that flaps with a good base may, without fear of sloughing, be reflected in any direction convenient.

My patient was a woman of 24 years of age, who was placed under my care by Dr. Proud, of Maryport, in August of this year.

Her history was that on April, 1895, she was delivered by instruments, after a hard labour lasting twenty-four hours, and that the child was dead. After her confinement she noticed that she had no desire to micturate unless she coughed, but she was not alarmed, for she did not know that anything was wrong. When she began to move about, she noticed that her urine was constantly dribbling away, but when she was in bed about 2 oz. could be retained. Her medical man who was consulted examined her, but said that it would come all right, for it was only due to weakness. After further advice, and no improvement, she consulted Dr. Proud.

In a letter which I had from Dr. Proud, he said that he had discovered the fistula by injecting milk into the bladder and watching it escape through the vagina. This device, though old, is so ingenious and easy of application that it is well worth remembering.

On examination, the vagina at the upper part was found to be narrowed by cicatricial bands, especially behind. The cervix was small and eroded. About three-quarters of an inch from the cervix, in the centre of the anterior vaginal wall, there was a rounded opening about the size of a split pea, which opened directly into the bladder.

The operation was performed on August 5, 1895. A horse-shoe shaped flap was marked out on the anterior vaginal wall. The toe of the horse shoe included the fistula, and the heel, which formed the base of the flap, pointed to the cervix. The vaginal mucous membrane was divided with a knife, the flap peeled off the bladder wall, and the opening into bladder fully exposed. All the separation was carried out with a finger and the blunt closed ends of a pair of scissors, except round the fistula, where cicatricial tissue made the union between bladder and vagina very firm. The opening in the bladder was now closed by a fine continuous silk Lembert's suture, holding the muscular coats only. An ordinary surgical needle and needle-holder served for the purpose, and it was easy to apply, for the bladder wall was slack, and there was no tension on the suture. The bladder was now tested by injection, and proved to be watertight. The operation was completed by cutting off the tip of the vaginal flap, including the fistulous opening in it, and adjusting the flap to the raw surface, where it was held by interrupted catgut sutures. The vagina was packed with iodoform gauze, and a self-retaining catheter left in the bladder. The dressings and catheter were left undisturbed, except that the bladder was washed out thrice daily for the first week. On the eighth day the vaginal plug and the catheter were removed. From beginning to end the patient had no trouble, the vaginal wound healed by first intention, the catgut sutures being absorbed, and she went home cured on the eleventh day.*

REVIEWS.

(*Northumberland and Durham Medical Journal*, 1895, p. 75.)

"Diseases of the Breast." (By W. Roger Williams, F.R.C.S.)

Mr. Williams has written the most complete monograph on diseases of the breast in the English language.

The style is as easy as is compatible with the introduction of a mass of important statistics and illustrative cases; the printing leaves nothing to be desired, and the illustrations are as excellent as they are numerous. The author is fond of long names, and assumes a knowledge of their meaning, which we are sorry to admit the average surgical reader does not possess.

Chapter I. begins with a short description of the ontogeny (development) and phylogeny (history of development) of the breast. The generally accepted view is taken that the breast is an enlarged and specially-developed sebaceous gland, and the developmental changes are traced from the beginning, and shortly but clearly described. Then the appearance of the nipple is traced through different animals up to man.

Chapter II.—Dealing with morphology, secretory anomalies, etc., begins with post-embryonic variations. One or both breasts, it is said, may be delayed in development after puberty, and premature mammary development is mostly met with in connection with precocious sexual evolution. Under secretory anomalies come—

* *I have operated by this method many times since with success.*

1. *Agalactia*, or complete failure of mammary secretion.—This is rare, and nothing seems to be known of its cause.

2. *Galactorrhœa*.—" Excessive hyper-secretion is a serious disease, leading to loss of appetite, emaciation, anæmia, and hectic symptoms." The only suggestion in treatment made is that suckling should be abandoned.

3. *Heterochronous lactation* (the secretion of milk at other times than normal) appears to be a very common condition arising at any time, and in either sex. According to the author, " mechanical irritation of the nipples, etc., is a powerful excitant of lactation : and most of the recorded cases are attributable to this cause."

Morphology.—" The external configuration (of the breasts) depends mainly upon the amount of adipose tissue present ; hence the largest seldom give the most milk."

The left mamma is said to be the larger, its association with the sexual organs more intimate, and its tendency to disease greater, because most mothers are right-handed and suckle chiefly with the left breast. Accord- to Hemming, with whom the author agrees, the normal breast has a tricuspid form. Two of the cusps project towards, and even reach into the axillæ, an upper and a lower one, and the third towards the sternum which it occasionally overlaps. " In the ordinary amputation of the breast these processes are almost invariably cut off and left behind." The areola appears to be an interesting study, for secretions from no less than three sets of glands are described as being poured out over it during lactation :—(1) The ordinary sebaceous glands (Tubercles of Montgomery), of which a circle exists around the periphery of the areola, and in connection with each of which a minute hair exists. During lactation they secrete a milk-like fluid. (2) Two kinds of sweat glands, the ordinary cutaneous form, and others much larger and more deeply placed—(described by Sappey). (3) Glandulæ lactiferæ aberrantes, or detached lobes of the mammary gland. " Several always exist," and their ducts open in the areola and pour out there the milk secreted by them.

Chapter III.—Mammary deviations per defectum.

1. *Amazia* results from arrest of development before the second or third month of intra-uterine existence. " Complete absence of both mammæ is one of the rarest congenital deformities." It is usually associated with grave malformation of the chest or sexual organs. Absence of the breast is usually attended by defect of the corresponding pectoral muscle, and in two recorded cases was found (post mortem) to be " associated with total absence of the corresponding ovary."

2. *Micromazia*.—" The rudimentary organs are useless for lactation." Defects of the pectoral muscles appear to be common in such cases, and they are frequently accompanied by defective ovarian development.

3. *Athelia* (congenital absence of the nipple) " is much more common than any of the foregoing anomalies." It is " usually unaccompanied by any other malformation, and it generally affects both breasts, and is due to defective nipple evolution." " In consequcnce, we often see persistence of the depression, which, in the normal course of development, marks the site where the nipple will subscquently arise."

4. *Involution, Atrophy, etc.*—" Disuse leads to atrophy, and the result is inherited." Hereditary syphilis has been noted as a cause of atrophy, also prolonged and excessive suckling, exhausting illnesses, and excess of iodide of potash. The treatment suggested will scarcely commend itself when the uncertainty of improvement is remembered. It consists of suction of the nipples, massage of the breasts, ovarian, and spinal

regions, and internally the administration of mild stimulating tonics and aphrodisiacs.

Chapter IV.—*Polymastiæ, etc.*—Phylogenetical.—" In the lowest mammalians, which represent the primitive type, the mammæ are, as a rule, exclusively inguinal; in the highest class they are almost invariably pectoral; whilst animals with abdominal mammæ occupy an intermediate position."

" Our early progenitors had at least seven pairs of mammæ on the ventral aspect of the trunk; of these only the present pectoral pair have survived. Of the six lost pairs three were situated above and external to the present normal pair, and three below and internal to them." Supernumerary breasts appearing in one or other of these positions " must be looked upon as true reversions."

Mammæ Erraticæ (very rare).—" I regard the so-called mammæ erraticæ as due to reversion to ancestral arrangements, much more ancient than those reproduced in ordinary cases of polymastia." We regard the whole story as an excellent example of the scientific use of the imagination.

Supernumerary Mammæ.—" In more than three-fourths of all cases supernumerary mammary structures have been found just below and internal to the normal mammæ."

Axillary Supernumerary Mammary Structures the author divides into two varieties—a sequestration form and one of atavistic origin. The sequestration forms, he says, are most common, and arise from an extension of the normal processes of the breast further into the axilla than usual, their pedunculation and final separation. Sometimes the milk secreted by them during lactation is discharged through the nipple of the normal breast, at others through a nipple of their own, and at others through a skin-pore in the axilla. At times they have no external communication, and may be mistaken for tumours. Any of these forms of supernumerary mammæ are subject to the same diseases as the normal breast.

Chapter V.—*Hypertrophy of the Breast.*—This is divided into diffuse and circumscribed. The diffuse form is very rare, and is much more common in females. The infantile form of hypertrophy is mostly met with in association with precocious sexual development.

Of the diffuse hypertrophy of adults, the author writes, " Most cases arise about the time of puberty, when the breasts are in a transition state." In the ordinary form growth is steady and slow, but cases are recorded in which the hypertrophy has been acute, and causing so much constitutional disturbance as to end fatally. In all these cases the fibrous stroma is greatly increased, the glandular elements are scanty. On the other hand, in cases arising during pregnancy, the glandular elements are in excess. Favourable cases of hypertrophy end merely in deformity, the morbid process ceasing, but " in many instances the disease runs a most dangerous course." After reaching a certain size, the skin becomes inflamed and ulcerates, and gangrene of the breast is apt to supervene. The weight, too, of the breasts causes, serious embarrassment of respiration. " As a rule the most acute cases are those that arise in association with pregnancy; in these the danger to the life of the patient is greatest." The author attempts to explain the causes of this hypertrophy in a very elaborate manner, but, as any of his readers willing to take the trouble can invent as improbable a story, we will not discuss the explanation. Amputation seems to be the only treatment worthy of serious consideration, and the prognosis after operation is good.

Gynæcomastia or enlargement of the male breast, may or may not occur, in connection with genital defects, and is of no practical importance.

Chapter VI.—*Histology and Neoplastic Pathogeny.*—The changes occurring in the gland whilst passing from the resting to the active stage are well described, and illustrated fully by excellent drawings of microscopical preparations.

Under neoplastic processes, the author explains tumour formation as follows :—" The formative activity of the cells (of the acinus) predominates over their secretory (physiological) activity. This accumulation within the acini causes them to become greatly enlarged. Solid bud-like cellular processes arise from their walls, which grow and ramify in the adjacent tissues." " In the cases of cancer the process seldom advances much beyond this low grade of organization ; but, by a kind of continuously progressive germination, which is merely a superinduced repetition of the initial process, this crude formation grows and reproduces itself indefinitely." We were disposed on first reading this to take exception to the author's explanation ; but it is, perhaps, more in accordance with surgical custom to do as he has done, than to admit that nothing at all is known of tumour and cancer causation.

In the case of connective tissue tumours, Cohnheim's theory, that all tissues originate from buried embryonic remnants, is adopted, and the view expressed that everywhere these embryonic islets are discoverable. If the embryonic inclusion grows, and retains its embryonic characters, a sarcoma results ; if it develops more fully, a fibroma, an adenoma, a lipoma, or other simple growth. We would not have been surprised if the author had suggested a neoplastic centre in the medulla, by which the liberty of such dangerous elements is normally inhibited.

Chapter VII.—*On the varieties of Mammary Neoplasms and their relative frequency*, opens with the statement that " In no part of the body, except the uterus, do neoplasms arise so frequently as in the mammæ." If the author regards the skin as a part of the body, we do not think this statement can be accepted.

Of tumours of the breast, 81 per cent are said to be malignant, 18·3 non-malignant, and the author estimates that not fewer than 10,000 women are now suffering from mammary cancer in England and Wales.

" In the breast nearly 99 per cent of all its neoplasms occur in females, and only about 1 per cent in males. This is a good illustration of the law—of which many other instances might be cited—that functionless, obsolete structures have but little tendency to take on the neoplastic process." We would consider the breast a functionless and, if not already an obsolete structure, at least tending that way, at fifty years of age, a time when cancer is not rare.

Chapter VIII.—*The Pathology of Cancer and other Neoplasms, with special reference to the Microbe Theory.*—After a short historical survey, the author says the question now is : " Are neoplasms from first to last merely the result of the abnormal play of forces arising within the body, or are they directly or indirectly due to the intrusion of some irritant ab extra ? " His answer is, " I incline to the former alternative, and I think the future will see decided reaction in this direction." Later in the chapter occurs this passage :—" The microbe of cancer has not yet been discovered, because, in all probability, it does not exist." On the question of contagion of cancer, the author is equally decided. There is no such thing. Can it be that the author is wrong in both conclusions ? Is it not possible that chimney sweeps' cancer and paraffin cancer may be due to irritants ab extra, and, if possible for them, why not for other forms of the same disease ? Was not the contagious nature of tubercle for long denied ?

Chapter IX.—*The Morphology of Mammary Cancer.*—Two forms of cancer of the breast are described—the acinous or scirrhus—which include every malignant epithelial growth except the rare second form—the tubular or duct cancer.

Special attention is drawn to the fact that the radicles of the lymphatics are in direct communication with the cancer alveoli, a fact which explains the great frequency of dissemination in the lymphatic glands.

Histological observations, especially those of Heidenheim, have shown " that every mamma containing a cancerous tumour is diseased throughout." Secretory cells and connective tissue both show characteristic changes, Heidenheim's researches also show " that the loose areolar tissue intervening between the mammary gland and the pectoralis major muscle contains numerous glandular offshoots and lymphatics, which in cancer cases are nearly always diseased. Some of these not only adhere to the fascia over the muscle, but often penetrate it, and even become embedded in the muscle itself." Stiles's method of staining for the macroscopic discovery of the growth is noted, and his observation recorded that, like Heidenheim, he had found the disease incompletely extirpated by the ordinary operation, and drawing special attention to the fact of the skin being frequently involved by its intimate connection with the breast through the ligamenta suspensoria.

The lymphatics of the breast are exceptionally numerous. The branches from the various sources, including nearly the whole breast, " converge towards the areola, beneath which their large trunks communicate freely, forming the sub-areolar plexus of Sappey. Most of the large trunks that go to the axilla arise from these vessels. The paramammary lymphatics communicate on the one hand with circumferential mammary branches, and on the other with the subcutaneous thoracic lymphatics. Through these channels the lymph systems of both breasts communicate indirectly."

" In forty-three of Küster's cases (of mammary cancer), with no clinically appreciable disease of the glands, signs of cancerous dissemination were, nevertheless, found in them on histological examination after removal." Gussenbauer has found the lymphatic glands involved in all but a small percentage of cases of cancer from all parts. How, then, are we to reconcile this knowledge with the fact, well known to surgeons, that a cure is sometimes effected by removal of the growth alone. The author's explanation appears to us to be the correct one : " There are good grounds for believing that the majority of these ' cancer emboli ' perish, and are absorbed, owing to the metabolic activity (phagocytosis) of the cells of the glands ; and that only those with sufficient vitality to overcome this resistance originate dissemination tumours." Surely a much more antagonistic agency against an extrinsic than an intrinsic cause, and a strong argument against leaving tissues damaged by tearing and rough manipulation in the bottom of the wound !

A large number of figures are quoted, showing the percentage of cases in which the lymph glands are involved, but the results arrived at by different authors vary so widely as to be practically useless. Metastasis in liver, lungs, brain, etc., are said to occur sooner or later in about 73 per cent of cases. Dissemination, the author holds, is due to the conveyance of malignant emboli, chiefly by the blood vessels. The cancerous cachexia is said to be due to autointoxication from absorption of the products of the cancer cells, and marked changes in the blood especially. Leucocytosis is described as occurring in even the early stages. With regard to recurrence, statistics of Gross are quoted. A return of the growth locally was observed in the mammary region alone in 59·27 per cent of cases ; in the mammary region and adjacent lymph glands in 23·59 per cent, and in the adjacent lymph

glands alone in 15·5 per cent. General dissemination rarely occurs without local recurrence. It seems to us that such figures do not strongly support the view, generally accepted, that the glands should be removed in every case, whether enlarged or not.

As to the time at which recurrence takes place, it is said that 60 per cent of all recurrences take place within the first six months. Only 4·3 per cent of all recurrences originate after three years.

The author has seen no case of spontaneous cure, but appears to think it possible, and records cases which have nearly healed, and others of many years' duration which have made very slow progress.

Chapter X.—*General Pathology of Mammary Cancer.*—The excessive liability of the female sex is first pointed out in long statistical tables, and the author explains it by stating that cancer is "most prone to arise in the sites of greatest post embryonic developmental activity, where cells most capable of growth and development most abound."

On the influence of age, he says, "No well authenticated case of breast cancer has been cited before 20 years of age, and it is held to be proved that the period of its greatest relative, as well as absolute frequency, is between the 40th and 50th years." He also holds that the figures he quotes "clearly show that cancer is *not* a senile disease, and that senility *per se* plays no essential part in its development. The contrary belief is a mere myth that by dint of continual repetition has gained widespread credence, without there being a particle of truth in it." It is consoling to know that statistics show that cancer seldom originates in extreme old age, but the consolation is somewhat weakened when we remember having met with more than one exception to the rule, and possibly the author would have appealed more to our feeling in the matter if he had said that each of us would die of cancer if long-enough-lived.

Then comes a discussion of the influence of complexion, race, geographical distribution and topography, etc., with masses of statistics bearing on each.

The familiar figures of Haviland—showing that the greatest cancer mortality occurs in low-lying districts, traversed by (or contiguous to) rivers that seasonably flood the adjacent riparial lands—seem to us the most interesting and important portion of this chapter.

The author's view—"other things being equal, there are, in my opinion, no more potent factors in the causation of cancer than high feeding and easy living"—will scarcely appeal to readers here, when they learn that Durham has a cancer mortality which contrasts favourably with the generality of agricultural districts.

On the Heredity of Cancer is an interesting chapter to study; and some remarkable family histories, full of cancer, are related. The author is a strong believer in the hereditary transmission of a predisposition to the disease, and backs up his faith by many figures. Other authorities, amongst the strongest, Harrison Cripps, advance arguments and convincing statistics against the heredity of cancer. The fears and anxieties of patients may meanwhile be fairly allayed by a denial of hereditary transmission.

On hereditary proclivities correlated with cancer, the author draws pointed attention to the frequency of cancer in tuberculous families, long-lived families, and those possessed of great reproductive fecundity. We have long recognized this connection, and are fully persuaded of the truth and importance of the observation.

Cancer is increasing, and "will ere long become one of the commonest diseases of modern communities."

Concerning the general and previous health of cancer patients, the

author states that the Mr. and Mrs. John Bull of "Punch" are the characteristic sufferers from cancer. He does not believe that injury or inflammation predispose to, much less cause, cancer, and says: "Intrinsic causes are much more important factors in the origination of cancer than extrinsic ones, which are by no means its necessary antecedents. In the vast majority of cases the outbreak of the disease appears to be entirely spontaneous"—a very depressing belief for the sanitarian who would prevent, or the surgeon who would attack, cancer.

Chapter XII.—Deals with the *Clinical Features of Mammary Cancer* under two headings—(1) Symptomatology, and (2) Differential diagnosis. Pain, retraction of the nipple, and dimpling of the skin are the chief symptoms and signs treated of.

Pain is said not to be the characteristic, and only appears regularly when the skin is involved.

Retraction of the nipple may be due to injury or disease other than cancer.

Dimpling of the skin over the tumour takes the most important place, for it is rare in other conditions.

Diagnosis is difficult, and certain cold abscesses and other chronic inflammatory swellings are said to be the chief sources of mistake. Tense, deeply seated cysts and syphilitic indurations are also mentioned as deceptive.

Pain and tenderness on manipulation are chiefly characteristic of inflammatory swellings; as is œdema of the skin over the swelling and a relation to pregnancy.

Dimpling of the skin, a well-defined margin, and extreme hardness of the swelling are in favour of cancer.

"In doubtful cases, an exploratory incision into the tumour may be made; but, even then, the naked eye appearances sometimes mislead, so that, when necessary, the microscope must also be invoked. Under certain circumstances, even the most experienced may sometimes be mistaken."

We would alter the two last quotations, and, putting the last first, would say:—The most skilful and experienced is frequently mistaken, and no cautious surgeon would remove a breast without first verifying his diagnosis by incision. We would also add that every doubtful breast tumour in a woman over 35 should be incised, at the earliest opportunity, to complete the diagnosis; and that the cut surface and edge of a cancerous growth yield to the finger introduced through the wound a sensation scarcely to be mistaken.

Chapter XIII.—*The Treatment of Acinus Cancer.*—The author begins by saying that "Pathological doctrine points so emphatically to the possibility of cancer being curable, by sufficiently thorough operations, that no one now-a-days doubts the propriety of such proceedings." A little further on he says, "At first sight, complete extirpation seems to be a very simple affair; yet nothing is more certain than that in the great majority of such operations, even as done by experienced surgeons, this result is not obtained." The skin overlying the growth, the paramammary adipose tissue, the whole of the gland (bearing in mind its prolongations), the sheath of the pectoral muscles, with a large part or even the whole of the sternal portion of the muscle, the lymphatics and fat between the breast and axilla, and the axillary glands and fat are to be cleanly dissected away *en masse*. In this the author agrees with Halsted, of Baltimore, whose excellent results, published in the December number of the *Annals of Surgery*, must stimulate surgeons to more thorough operations. Both authorities emphatically condemn tearing away of the axillary contents piecemeal, as frequently practised.

An operation is described fulfilling the indications given, and it is said "the only contra-indications to operation are such widespread local or lymph gland dissemination as would render impossible the removal of the entire disease, as in cases of cancer *en cuirasse* and some other forms of diffuse cancer; and, of course, operation is contra-indicated when there is reason to suspect dissemination of the disease in internal organs." This is surely allowing a greater operative freedom than would be considered justifiable by most surgeons. The author, with a determination that nothing shall be left undone by his book, enters ramblingly into the details of preparation of patient, sponges, antiseptic dressings, etc., the choice of an anæsthetic and antiseptic, theories. He says of the dressing—"It should be changed for the first time on the day after the operation; for the next few days daily, and subsequently every three or four days. After the first few dressings, provided all is going on well and the drainage tubes have been removed, only the outer dressing need be changed." This reads strangely, when we now expect every ordinary breast case to heal under one dressing, applied on the completion of the operation, and regard the use of a drainage tube for such as a thing of at least ten years ago.

The mortality and causes of death after operation are discussed, but after Halsted's publication (76 cases without a death), the mortality of the London hospitals, quoted at 8·10 per cent, cannot be regarded as other than miserable, which indeed it is. The same may be said of the question treated of, viz., that of cure by operation. The author's latest statistics show a cure "in at least 15 per cent of all cases." Halsted has left this far behind, and expects, with well-placed confidence, to cure the great majority.

The author then describes different methods of applying caustics which he would only use when, for any reason, the knife is objected to; and finishes the subject of mammary cancer by a short article on its palliative treatment.

We have dedicated so much space to the author's views of cancer of the breast, and a criticism of some of them, because of the importance of the subject. When the next edition is called for, we hope fresh facts and figures will have shown the author—(1) That cancer is less dependent on heredity than most diseases; (2) That it commences as a local disorder, is due to some extrinsic cause, and is curable in the earlier stages at least by operation; (3) That a simple means of prevention is within measurable distance.*

The remainder of the book is occupied by a full account of all the remaining diseases to which the breast is liable, and the whole forms a valuable work for reference on the subjects of which it treats. Another edition could be made more interesting by keeping figures and statistics as an appendix, and by further methodizing the text.

"Text-Book of Operative Surgery." (By Dr. Theodor Kocher, Professor of Surgery and Director of the Surgical Chair in the University of Bern.)

All operating surgeons should possess themselves of this excellent text-book. The whole book is a protest against the mechanical and cut and tie practice of surgery, and is suggestive at least of possible improvements in the technique and results of even ordinary operations, when anatomical and

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* *The best present means of prevention is to remove all foci of chronic irritation.*

physiological facts are brought fully to bear on surgical work. The author describes only such operations as he has done and can speak of with authority; and, "in writing this text-book, we have aimed at making it not merely useful for teaching purposes, but also, in view of the author's extensive experience, a reliable guide to general practitioners and surgeons in operating on the living subject."

In the introduction the author says: "A complete mastery of technique, which depends chiefly upon a minute knowledge of anatomy, is, next to a reliable antiseptic wound treatment—the condition most essential to the practice of operative surgery." Later, "We have omitted all directions concerning the choice and form of instruments, the holding of knives, the handling of forceps, scissors, saws, etc., and the different methods of suturing. It is our conviction that no written instructions, however exact, are sufficient to educate a surgeon."

We hope by these quotations to have given a fair idea of the spirit of the book.

The subjects of anæsthesia and wound treatment are next considered. Ether is confidently spoken of as the safer anæsthetic, an opinion generally held now. It has, it is said, however admitted drawbacks, and chloroform, if given with great care and skill, is quite safe. The author in long operations prefers that the patient should be 'put under' with chloroform, and the anæsthesia continued by ether—a method we can recommend, for we have practised and advocated it for the last twelve years.

Under wound treatment the guiding principles are first considered; then the author's methods are shortly related. The measures advocated are so simple as to be capable of being carried out almost anywhere, and are, we know, as efficacious as more extravagant precautions. We can imagine, but do not care to attempt a description of, the scorn the author would feel for the antiseptic surgery of many of our English surgeons. There is no English text-book which assigns to a proper understanding of the principles of wound treatment the first place in surgery; yet few English surgeons are prepared to deny that they do occupy this place, and many are prepared to uphold this view as strongly as the author himself. For this reason alone we regard the present work in advance of our most recent text-books, just as we cannot doubt that German surgery in respect of antiseptics is ahead of English. Is it not time that we gave up dipping in corrosive and carbolic as mystic rites, and recognized the importance of personal and thorough attention to wound treatment; or is English surgery going to content itself with a back seat?

The next subject dealt with is one of the most interesting in the book, and relates to skin incisions. Diagrams are introduced, showing Langer's lines for the direction of cleavage of the human skin, and the results of studies of the author upon the gaping of skin incisions. These show that incisions made in the lines of cleavage do not gape and are linear, whilst those made transversely to them gape and are elliptical. The vessels and nerves mostly run in the direction of greatest tension. The importance of this has made the author describe what he calls *normal incisions* for every region of the body, and a quotation will best emphasize his meaning: "We have convinced ourselves that the scars resulting from the operation for goitre, which are here so frequent, become, in the course of time, after such normal incisions, so fine that one has actually difficulty in recognizing them; whilst scars resulting from incisions otherwise arranged often severely deform the neck by contraction and puckering." It is also pointed out that to cut a nerve is more serious than to cut a blood vessel, and even the smaller

nerves should be regarded. Small skin incisions are strongly condemned by the author. "The true surgeon makes a free skin incision, but proceeds as carefully and sparingly as possible in making the deeper dissection." A large skin incision heals as rapidly and certainly as a small one, and "the larger size of the resulting scar is of no significance, provided it runs in the proper direction."

The illustrations, 185 in number, are sufficiently good to make the description of the operations readily understood, and to give a clear, though rough, reminder of the anatomy of the parts to be dealt with.

It would be impossible in the space at our command to make an elaborate analysis of this valuable book; but, turning to two subjects which have lately attracted active surgical attention, we will see what our author has to say.

Of amputation of the breast for carcinoma, he writes: "We have to deal here, not merely with the removal of a cancerous nodule, but with the thorough removal of all suspicious tissues, together with the lymphatic vessels and lymphatic glands. The further course of the disease depends upon the way it (the operation) is performed, and therefore the responsibility of the surgeon is great." The operation recommended is scarcely so thorough as that advocated by Halsted, but it involves a sacrifice of skin for two fingers' breadth beyond the adherent growth; the removal of the whole breast, remembering its considerable prolongations, and, along with it the pectoral fascia and lymphatic vessels and fat in which they are embedded, and attached to them the contents of the axilla, cleared out by a clean dissection, including even the fascia, covering the subscapularis, but leaving, as far as possible, the vessels and nerves. How does this compare with the operations we perform for cancer of the breast, and how would the prognosis in cases of cancer, removable by operation, be influenced if the responsibilities of the surgeon were recognized as Professor Kocher wishes?

Turning next to intestinal resection, we find that the author has and expresses very definite views, and that his methods have one great merit—their simplicity. End-to-end union is the only plan worth serious consideration. No plastic slices must be taken out of the mesentery, and the continuous suture is "alone permissible." There is no room for buttons, plates, or bobbins, because there is no need for them. We are, perhaps, quickly reaching the latter position; but with two of the former conclusions we cannot agree. End-to-end union is mechanical perfection; but we believe that it does not meet all surgical requirements. How can the nutrient vessels running circularly in the walls of the intestine escape the constriction of sutures in an end-to-end anastomosis? And it is essential, as Professor Kocher himself urges, that the vitality of the opposed ends should be beyond suspicion. Is this not the explanation of Professor Kocher's difficulty, for his method is only successful in the small intestine. "In resection of the ascending or descending colon, of the lower part of the sigmoid flexure, and of the commencement of the rectum, it is often difficult to decide whether the edges of the intestine possess an absolutely secure circulation; and in such cases the roundabout plan of making an artificial anus and performing secondary intestinal suture at a later date, is the only treatment which is calculated to bring about a successful issue." To this we cannot assent. We hold that closure of both ends, and a large lateral anastomosis is a safe operation in both small and large intestines.

The continuous suture is our second source of disagreement. For a first line of suture, to be subsequently buried, it has no equal, for it is rapidly applied, keeps all temporarily tight, and arrests hæmorrhage; but for an

outside suture, it is apt to constrict the vessels, and if one loop of it tears out, the remainder are rendered uselessly slack. To Lembert's suture no single objection can be raised, except that it takes time to introduce. With Professor Kocher's conclusion concerning the mesentery we agree entirely. It has always appeared to us to be a useless and dangerous addition to the operation of intestinal resection to cut wedges out of the mesentery.

English surgery is indebted to Mr. Harold Stiles for his readable translation of this work.

"London Temperance Hospital—Report upon the Surgical and Ophthalmic Cases Admitted During the Year 1894." (By Leonard Wilde, M.D., M.R.C.S., D.P.H.)

The report is a carefully arranged and elaborate account of the surgical work of this hospital, neatly bound, well printed, and certainly making the best of the surgical work done during 1894. But the report really does more than it pretends to; more than half of it is dedicated to a relation of the operations for hernia from 1888 to 1894, inclusive, and of extractions of hard cataracts from 1888 to 1894, inclusive.

The prefatory note contains the statement that the "total number of surgical patients admitted to the surgical wards during the year was 572; of these 373 were treated for disease, 104 for injury, and 95 were ophthalmic cases." Fifteen of these patients died. On 13 of the 15 fatal cases a post-mortem examination was made—a fact which speaks volumes for the care and enthusiasm of the pathologist.

General Statement of Patients admitted to Surgical Wards during the Year 1894.

Admitted	Males	Females	Total	Discharged	Cured or Relieved		Unrelieved		Died		Mortality per cent.
					M.	F.	M.	F.	M.	F.	
Surgical Cases	200	173	373	Surgical Cases	197	167		3	3	3	1·6
Injuries ..	74	30	104	Injuries ..	70	27			4	3	6·7
Ophthalmic Cases ..	41	54	95	Ophthalmic Cases ..	39	51	1	2	1	1	2·1
Grand Total	315	257	572		306	245	1	5	8	7	2·6

Total number admitted	572
Aggregate mortality	2·6
Average weekly number of occupied beds ..	37
Average number of patients per bed per annum ..	13·6
Average number of days of each patient in hospital	25·5

The first table, "General Results," is an odd illustration of the conclusions to which statistics from a limited field may lead the uninitiated, for the mortality of all the surgical diseases is put down at 1·6 per cent, and of the ophthalmic cases at 2·1 per cent.

Table I. is headed, "Abstract showing Surgical Diseases in Classes according to Authorized Nomenclature," and contains the usual imposing but unintelligible array of names and figures for the benefit of laymen interested in the institution.

Table II., "Abstract showing Injuries in Classes according to Authorized Nomenclature," contains a list of ordinary accidents, with the exception of one case, in which death after a fractured rib is said to have been due to its penetration into a phthisical cavity, so rare an accident as to be worthy of note.

Table III., "Surgical Operations, 1894," is a table of all the operations performed in 1894. From it we learn that there were five deaths. One followed an operation for mastoid abscess on an infant, and was due to infantile diarrhœa. A second arose from bronchopneumonia, consequent on an operation for double hare-lip, in the only case of hare-lip operated upon. The case emphasizes a fact not generally recognized, that hare-lip operations in infants are attended by a considerable mortality. (Jacobson, in his book on operative surgery, states that the only available statistics give a mortality of from 23 to 34 per cent.) Our belief, based upon some experience, is that the anæsthetic has largely to do with this excessive mortality, and for several years we have been in the habit of operating on children under six months without chloroform or other anæsthetic than a small dose of dilute whisky administered shortly before the operation. Our operations include patients from two hours of age, and, with the exception of one death in a neglected child, the mortality has been nil. During these years we have had the opportunity of observing several deaths from lung complications in the hands of operators who use chloroform, and attribute them to inhalation of blood, which cannot be properly expelled by an anæsthetized patient.

A third death followed herniotomy for inflamed femoral epiplocele, and under the heading "Remarks" the name of the surgeon who operated for Dr. Collins is specially mentioned. Some surgeons might resent the introduction of their names in this fashion and under the circumstances, more especially if no further mention was made of them in the report!

The fourth death resulted from an operation for the radical cure of a congenital enterocele, and was one of five cases operated upon. It is further noticed under the hernia operations.

The fifth case was a laparotomy for intestinal obstruction, the only operation done for this cause. In this case, judging by the post-mortem record (page 57), intestinal contents must have escaped into the peritoneum from the artificial anus made at the operation, for no other opening is mentioned, and fæculent fluid was found in Douglas's pouch. Such an accident may easily be avoided by the use of a Paul's tube, or by the device of Greig Smith of inserting a stretched india-rubber tube into the opening, and allowing it to expand before the gut is sutured to the parietes.

The sixth and last case which died was one of acute necrosis of the tibia, and death occurred from pyæmia. The disease was alleged to have followed vaccination; the diaphysis of the tibia was removed. Secondary infection of a rib, with empyema and lung abscess, were the causes of death.

Table IV., "Special Operations." Under this heading a number of ordinary surgical operations are shortly described. Shortly, we say, but we must add, sufficiently graphically to curdle the blood of the lay subscriber and make him talk of the wonders performed. Operations for varicocele, for hernia and for hydrocele, osteotomy and ovariotomy, and scraping the cervix uteri for cancer, are all described in the manner mentioned in this

chapter. As an example of this series, we may quote the record of the single ovariotomy performed :—

"Abdomen enormously distended. Paracentesis performed and several pints of ascitic fluid evacuated. Ovarian tumour then palpated. Incision in linea alba, below umbilicus. On opening peritoneum, large quantity of fluid escaped and a large multilocular cyst arising from left broad ligament presented. Its surface presented numerous papillomatous growths. Several adhesions to sigmoid flexure had to be separated. Cyst punctured with Wells's trocar, and contents evacuated. Pedicle very broad, transfixed, ligatured with silk and dropped. Abdominal toilet carefully carried out and the peritoneum and superficial tissues sutured. As there had been considerable hæmorrhage, a glass drainage tube was introduced into Douglas's pouch. Cyanide dressing. Temperature never rose above 100°. Tube removed on third day and stitches on sixth. Small abscess in course of a superficial suture during convalescence."

Table V., "Cases of Herniotomy and Radical Cure for Hernia, 1888 to 1894, inclusive." For strangulated inguinal hernia there were three cases. Of these one operated on in 1888 recovered in spite of an attack of acute mania ; the other two, operated upon in 1890 and 1893, died. There is a curious similarity between the two cases ; both were old herniæ. The first became "irreducible" two days before admission. In the second "acute symptoms" were present for twenty-four hours. Both apparently were just such cases as we feel should make an "uneventful recovery ;" but in this we are disappointed.

Of the first fatal case, operated upon in 1890, under course of operative treatment the following is to be found :—"Ice, opium, hot bath, and taxis tried without success. Herniotomy was performed, etc."

Of the second case, operated upon in 1893, under the same heading :— "Hot baths, ice bags, taxis under chloroform failed. Herniotomy performed."

The first had cellulitis of the scrotum and suppuration of the tunica vaginalis, and had experienced considerable difficulty with his bowels up to the time of his death. The second died after resection of his gangrenous gut. This valuable record tells its own tale.

For strangulated femoral hernia there were eight cases, of which six recovered and two died. As in one of the cases death may fairly be attributed to heart failure in a feeble subject, the recovery rate for hospital herniæ is exceptionally good.

For strangulated infantile hernia there was one operation. The patient, a puny infant of seven months, had an irreducible swelling in the right inguinal region. "Enemata and inversion tried unsuccessfully. Vomiting became fæcal." After the operation there was a "sudden escape of fæculent fluid through the wound, collapse, and death."

For strangulated umbilical hernia one operation was performed, and the patient made a "speedy and uncomplicated recovery."

The perusal of the short notes of these cases raises again in our minds the question of operation in strangulated hernia. We wonder why surgeons still persevere in the use of methods likely to fail, more dangerous in their application than the operation which usually has to follow, and never without some ill effect. How much of the mortality is due to the taxis, the inversion, the hot baths, the opium, and, above all, the delayed relief in these cases ? The advocates of taxis say it is less dangerous than operation in strangulated hernia, and that statistics prove this. The statement is only a corroboration of the old saying that statistics may be made to prove anything. We make bold enough to assert that, in skilful and careful hands, the operation for

strangulated hernia is devoid of danger; and the same only holds good of taxis when it is used with equal care and skill and during the first hours after strangulation. The operation should have nothing to do with the mortality. If it has, the operator is to blame. Everything depends upon the condition of the gut, and that practically altogether upon the time it has been strangulated. The surgical aphorism most applicable to cases of strangulated hernia should be—*Delay is death!*

For the radical cure of congenital hernia eight operations were performed; seven recovered, one died.

The post-mortem record of the case which died is:—"Incision wound in right inguinal region. Inguinal canal closed. No intra-abdominal communication. Spermatic cord and right testicle gangrenous. Pus in tunica vaginalis. Intestines and other organs healthy." This case can only be regarded as a surgical calamity. It occurred in the year 1894.

Of the seven cases that recovered, in three the wound suppurated for some time, and in other two there was inflammatory induration round the wound, which subsided without suppuration. All the cases were operated upon since 1891. It is a well-recognized fact that there is a difficulty in making and keeping hernial wounds aseptic; but this does not account for such a large percentage of failures in the wound treatment. The position of the incision is not recorded, so that we cannot say what percentage of the failures may be attributed to infection from the scrotal skin. However carefully the antiseptic toilet of this may be performed, a small percentage of wound infections will result after incision of the scrotum. If, in performing the radical cure of hernia, the wound be kept away from the scrotum and suitably dressed, not more than 5 per cent will suppurate.

Of the real after-results of the seven cases we learn very little, and that little is not encouraging. In one case a truss had to be worn, in a second an impulse could be felt on coughing, so that neither of these cases can be called radical cures. The remaining five seemed to have gone out of the hospital with their intestines intra-abdominal, but what came of them afterwards is not recorded. That two of them suppurated we know, because it is of none of the suppurating cases that truss and impulse are recorded, and experience has taught us that nearly all cases of 'radical cure' which suppurate recur. Honestly recorded failures may teach a great deal, and we have no fault to find with the honesty of this report; but the lesson it would convey has been impressed upon us so strongly here that we are almost tired of mention of the subject of wound treatment.

For the radical cure of acquired hernia four operations were performed. All the patients recovered. In two, femoral, there was no communication between the swelling and the abdominal cavity, so that considerable doubt must be felt as to whether a hernia ever had been present.

If it was, it had been radically cured before an operation was undertaken. Whether it remained so after the operation performed, the record leaves doubtful of the first case, but the second was discharged healed, with a firm cicatrix.

Of the two inguinal, the first was discharged wearing a light truss; of the second, the only report is: "Healing took place by first intention. Stitches removed on fifth day."

Table VII.—Under this heading we find a few more details regarding the ninety-five ophthalmic cases admitted into the hospital during 1894. There were two deaths in the ophthalmic wards. One case was admitted for diabetic cataract, and subsequently to the operation died from diabetic coma, preceded by convulsions, during which the ocular contents were

extruded. We have known of two apparently similar cases; in both the corneal wound healed satisfactorily without any untoward local symptoms, yet both patients died from diabetic coma within ten days. There seems to be little danger of anything going wrong with the operation or the after-progress of the wound, but the depression that attends the necessary confinement seems to have a most prejudicial effect on the disease. The other case had his eyeball ruptured during a drunken brawl, and died from syncope during the administration of chloroform. An abstract of the post-mortem report is given in another table. We may note in passing that of the seventeen cases of hard cataract admitted, they are all entered as cured or relieved, though only fifteen extractions of hard cataract were made; presumably the preliminary iridectomy that was performed on the other two cases sufficed to warrant their being entered in this list.

The next table gives a list of the ophthalmic operations performed during the year 1894. There are only two columns for entering the results of the operations, viz., "Cured or relieved" and "Died." We consequently find some rather startling discrepancies. With the exception of the diabetic cataract, the fifteen cases whose cataracts were extracted are entered again as cured or relieved. We find, however, from a reference to the next table, that in one case the anterior chamber was not re-established for some weeks, and that acute glaucoma supervened five months later; and that in two other cases the visual result was limited to counting fingers.

The 12 operations of "keratonyxis" seem to have been performed on 4 patients. However, the fact that 7 men and 5 women are reported as cured or relieved by this little operation, would lead one to suppose that 12 patients were operated on once in this way. There were 7 cases of glaucoma treated by iridectomy—all cured or relieved, according to Table VIII.—but one of the 7 was unrelieved, according to Table VII. Again, according to Table VII., there were 7 affections of the muscular apparatus. Of these one was due to paralysis of the sixth nerve, and another was ophthalmoplegia. There were left 2 divergent squints, 2 alternating convergent squints, and 1 fixed convergent squint. However, from Table VIII. we find that there were 2 operations for advancement of the internal rectus, 6 tenotomies of the internal rectus, and 1 tenotomy of the external rectus. It would be interesting to know how these operations were distributed. An unnecessarily fine distinction in this table is drawn between enucleation and excision of the eye.

We now come to a tabulated summary of 62 cataract extractions performed from 1888 to 1894. Some eighteen pages are occupied with an account of the 47 extractions of hard cataract performed before 1894. Of these 47 cases the resulting vision was not noted in 6 cases; in 2 cases the eye had to be excised; in 6 cases the result was unfavourable; in 7 cases the vision is summed up by the expressions, "counted fingers," "can tell time," etc.; in 6 more cases the vision was insufficiently noted. It is scarcely necessary to point out that an observation that the patient could read J.4 with + 15 D, conveys no information as to his visual acuity, unless the distance of the test type from his eye is also stated. Of the 20 cases in which the visual acuity was more satisfactorily noted, the following table exhibits the results of the operation in a compendious form:—

Visual acuity ..	$\frac{6}{6}$	$\frac{6}{9}$ or $\frac{5}{9}$	$\frac{6}{12}$ or $\frac{5}{12}$	$\frac{6}{18}$	$\frac{5}{24}$	$\frac{6}{36}$	$\frac{4}{36}$	$\frac{6}{60}$
No. of patients ..	3	6	3	2	2	2	1	1

There were 15 extractions of hard cataract during the year 1894. Of these the results in only 3 cases are satisfactorily given; they are $\frac{3}{36}$, $\frac{6}{60}$, and $\frac{3}{18}$ respectively. In 7 cases the size of the test type that could be read is mentioned, without any note of the distance at which it was held. In 1 patient, who was quite illiterate, both eyes were operated upon, and the resulting vision is reported as good. In 2 cases the result is noted "counted fingers," and in 1 case the report is "unfavourable."

In the next table we find that 8 soft cataracts have been operated upon during the year 1894. The progress of the cases seems to have been uncomplicated in 5 of them, but as no visual results are given, we can make no statement about them.

1896

TWO CASES OF SYPHILIS.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1896, p. 3.)

The first case was that of a man who had a hard chancre five months ago. From time to time he had come for treatment, but had been erratic in his attendance. At present all the manifestations of his attack were located in his mouth. At each corner there was a crack, with thickened whitish edges, and almost painless, for the man readily opened his mouth widely when asked to do so. Cracks of this description were pathognomonic of secondary syphilis, and were of considerable diagnostic value, for they could scarcely be missed in the consulting room, and were often one of the last traces of the secondary syphilitic eruptions. On looking into his mouth, other characteristic mucous patches were visible at different parts, and these had resisted the local application of chromic acid solutions and the general antisyphilitic treatment adopted. Under these circumstances it was not difficult to say that the man was a smoker, and that the obstinacy of his mouth sores were due to this, for in non-smokers and women such sores readily yielded to the treatment which had been unsuccessfully tried in this case.

The second case, which was under Mr. Page's care, and to whom Mr. Morison was indebted for the notes taken by Dr. Alderson, and their use in this case, was a man of 22 years of age, thin, miserable, and weak-looking.

History of Illness.—Patient dates his illness from the third week in December, 1894—ten days after intercourse. He first noticed on that day a slight running of yellow matter from the meatus and a sore on the outside of the prepuce. The sore was just a scab which came off, leaving an ulcer. He went to a doctor, who gave him medicine, and some dust and ointment for the sore (dust evidently iodoform). He got better, as he thought, and noticed nothing more till about the 23rd of February, 1895, when his throat became very sore, and little ulcers appeared on his mouth and tongue.

Red blotches appeared at the same time on his skin, which were most marked at night, when he usually became feverish. The penis was quite healed.

His throat and skin got better under treatment in about two months. Just as his throat was nearly well his head became sore and his hair began to come out. At the same time small spots appeared on his arms and legs. He applied ointment, which removed the ' tops ' of the spots, leaving ulcers, which gradually increased in size.

About the beginning of July a small spot appeared on the under surface of his prepuce, just behind the meatus. It spread quickly, and was just like a great yellow scab on the under surface of the prepuce.

The scab continued to spread, and all of the prepuce seemed to disappear as the scab separated.

The scab then involved the penis itself, which ulcerated in the same way—this stage being reached by the second week in August.

On admission the patient was in a very weak and emaciated condition. The glans penis was hollowed out with two deep ulcers, almost separating it from the rest of organ. Large copper-coloured, scaly patches were to be seen on legs, arms, and shoulders, and a well-marked rupial eruption on the right elbow. A patch of alopecia was also seen on the head, and this was also scaly and of a coppery colour. He had a temperature on admission of 100·6° F.

The severe illness, the rupial sores present at this early date after inoculation, and the intractable ulceration of the penis, which had destroyed the prepuce and glans, mark the case as an example of the malignant type of syphilis, a sufficiently rare form of the disease to justify one in occupying the time of the Society.

In seeking for an explanation of the marked malignancy of this case, I find that there is a strong consumptive taint in the patient's family, and he admits that he has drunk more than is good for him. The latter may have had some small influence, but I believe that the former is much the more important element in determining the result. I have no doubt whatever that syphilis is a much more serious disease than ordinary in persons with a tuberculous predisposition, for careful enquiry in several cases similar to this has elicited a similar family history, and among the most obstinate cases to treat are 'scrofulous' children with congenital syphilis.

This patient is being treated with small doses of hydrarg. cum creta and cod liver oil, and is being allowed a specially generous diet. The influence of mercury in such cases has to be carefully watched, and the continuous use of it is rarely possible. Under the treatment adopted there is little difficulty in prophesying that the patient will speedily get rid of the external manifestations of his disorder; but that anti-syphilitic treatment will have to be kept up for a considerable time if permanent good is to be effected.

A CASE OF EXCISION OF THE UPPER JAW.

Suggestions asked for the deformity caused by falling in of the Cheek below, and dropping of, the Eye.

(*Northumberland and Durham Medical Journal*, 1896, p. 8.)

Mr. Morison proposed that the coronoid process of the corresponding lower jaw, with a portion of the temporal muscle, might be detached and drawn over the gap and under the eye, the detached bony process being sutured to the nasal bones of that side. He would anticipate that the muscle would carry with it a sufficient vascular supply for the nourishment of a considerable piece of bone.

EXTRACT FROM REPORT ON TWO CASES OF RODENT ULCER,

With Specimens and Discussion.

(*Northumberland and Durham Medical Journal*, 1896, p. 102.)

Mr. Williamson's second case was that of a man with an ulcer at the base of his ring finger, with the same sharp edge and glossy base. It had

commenced as a wart, or in a wart, and had involved the supra-trochlear gland. The finger and the ulcer were removed together. A section of the gland exhibited proved its malignancy, but the section had more the appearance of scirrhus than epithelioma. If microscopic sections of the two ulcers were compared, no one could doubt that they were the same disease.

Mr. Rutherford Morison doubted the diagnosis in Mr. Williamson's second case, because of the involvement of the supra-trochlear gland. He thought that, in this instance, the microscope was not an infallible guide. Any irritated epithelial surface would proliferate, and he had seen and prepared sections from a case of leprosy, in which the appearances were precisely those of a rapidly-growing epithelioma. In spite of the strong microscopic resemblance, he believed that rodent ulcer and epithelioma were very different things. The long history, the non-involvement of glands, the appearance of the ulcer, and the extreme local malignancy, were the distinguishing features of rodent ulcer.

CHRONIC ABSCESS.

(*Northumberland and Durham Medical Journal*, 1896, p. 130.)

Mr. Morison brought before the Society a case showing the result of a new form of treatment for chronic abscess. The case was one of enormous tuberculous abscess of the buttock, due to disease of the front of the sacrum. The pus had escaped through the great sciatic notch. The abscess had been dissected out through an incision right across the buttock, and portions of diseased bone removed from the front of the sacrum. The wound made was entirely closed by catgut sutures after thoroughly drying the cavity left. Healing had occurred by first intention; and at the present time, six months after the operation, the man was so far as could be seen in perfect health. A similar method employed in the treatment of a large psoas abscess, due to spinal caries, in a woman of 42, necessitated an incision from the twelfth rib behind to the middle of Poupart's ligament in front, and turning up of the peritoneum as for ligature of the common iliac artery, also a second incision on the front of the thigh. Notwithstanding the magnitude of such an operation, he thought it was infinitely preferable to any other; for in this woman, as in the man, healing had occurred in eight days, and her recovery appeared to be permanent, for it was now of nine months' duration.*

Mr. Morison also showed an interesting case of perforating ulcer of the foot, the exact cause of which could not be ascertained, although every possible cause of perforating ulcer was considered by the members present.

HÆMORRHAGIC DUCT-CANCER OF THE BREAST.

(*Transactions of the Pathological Society of London*, 1896.)

The specimen was removed from a married woman, aged 39, who was admitted to a hospital with pain and swelling in the left breast. Three

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* *My faith in this large operation continues. The improvement in health following removal of the abscess has to be seen to be believed.*

years previously she fell from a tram, and the same night felt pain in that breast. A slight discharge of blood from the nipple was seen, and this had been present more or less ever since. Three months before, the patient felt a small lump in the breast, but it was not then painful. On admission there was a firm, semi-elastic tumour immediately beneath the left nipple; it was about an inch and a half in diameter, and had ill-defined edges. It was attached to the substance of the nipple, but the skin over the tumour was not adherent. There was much bloody fluid discharged from the nipple. The axillary glands were enlarged. The breast and the whole of the axillary glands were removed by operation. These glands were much enlarged and infiltrated with secondary deposits, but were not examined microscopically.

The growth in the breast proved to be a duct-carcinoma, and was remarkable for the extreme engorgement of its capillaries and the extravasation of blood into the stroma.

The tubular structure of the epithelial growth is fairly well seen, but it is to some extent modified by the extraordinary dilatation of capillary vessels which run in the delicate stroma surrounding the tubes, or forming the core of papillary processes of the growth. Indeed, so abundant is the blood in some portions of the tumour that the tissue has an alveolar appearance, the alveoli being filled with blood corpuscles, and the walls formed of distorted epithelial cells which represent the original tubules flattened out by pressure. Probably much of this blood is in reality extravasated into the loose cellular tissue around the engorged capillaries, the outlines of which are easily discerned. Two results would appear to have followed from this engorgement and extravasation: firstly, the flattening of the epithelial tubules as described; and secondly, large tracts of the growth have undergone necrotic changes, so that they would not stain. The latter change may be due to interference with the blood supply by extravasation into adjacent areas. The vascularity of duct-cancers of the breast is well-known, and the specimen here described indicates very well the mode in which such growths may sometimes be converted into blood-cysts, and so lose their malignant characters, or at least be mistaken for blood-cysts of a simple type.

A CASE OF CONGENITAL TUMOUR ON THE FACE OF A CHILD.

Read before the Obstetrical Society of Edinburgh, June 10, 1896.

(*Edinburgh Medical Journal*, 1896.)

John R. C., age 11 months, was born with the tumour, which had not increased out of proportion to his growth since birth. When he was two months old it began to bleed spontaneously, and he lost a good deal of blood. It had done so several times since, and he had occasionally lost a serious quantity of blood. Lately the bleedings had become less frequent and less severe. There had been an almost constant discharge, yellow in colour, and offensive in smell, which came from the side of the tumour next the nose. The teeth connected with the tumour were cut with the first ordinary teeth, when the child was eight months old.

Family History.—No previous deformity can be recalled on either father's or mother's side. On the mother's side there is a strong tuberculous history.

At first sight the tumour looked like one of the large orbital sarcomata frequent in children, for looked at from the front it hid the right eye. The upper portion of it (light-coloured in the photograph) was covered with thick skin, the lower (dark in the photograph) with apparently normal mucous membrane. The growth looked as if it was coming out of an opening in the side of the nose, and had carried the skin of the nose forward in its upper part. The tumour was surrounded by a sulcus about half an inch deep, ending blindly. The outer edge of the sulcus surrounding the tumour was specially well-marked and raised into a prominent margin with two tubercles and a division between, one of the tubercles had cut a well-developed temporary incisor tooth, the other was about to do so. The two tubercles looked like two maxillary processes with a hare-lip between. The nostrils were normal. The tumour did not communicate with the right one, which reached the pharynx. The mouth and palate were normal. The whole frontal bone on the side of the growth appeared to be much enlarged, but this may have been in part due to an oblique deformity, for the opposite occipital region was less prominent than the right. On the tip of the nose there was a small acorn-shaped projection, from the apex of which sebaceous matter was expressed by squeezing the swelling. No hair was seen in this matter.

Operation.—A flap of skin was dissected off the growth, and the whole of it removed with a gouge. The edges of skin round the base of the growth were pared, and the flaps sutured to them covered the whole raw surface. The base of the growth was solid, and entirely blocked the upper part of the nose. The child made a good recovery.

The growth, about the size of a Tangerine orange, was divided, and duly sent to Mr. Targett for histological examination. There was a dark pigmented streak running through it, probably the result of exploration with a hypodermic syringe some months earlier.

Mr. J. H. Targett's Report.

The tumour must be regarded as a teratoma, of the variety known as epignathus, in which a portion of an abortive twin has been included between the halves of the median cephalic fissure. The imperfect lip and the two tooth germs are sufficient evidence of fœtal elements. Such teratomata usually protrude from the mouth, or from a common naso-buccal cavity, the halves of which have been prevented from uniting. In this instance we must suppose that the fissure between the fronto-nasal and right maxillary processes did not close, and the included teratome protruded through the aperture. Hence its partial covering of mucous membrane. Histologically it shows little more than fibrous and mucoid tissues irregularly mingled. No muscle was seen. A piece of hyaline cartilage was attached to one side of the preparation ; but this I concluded was cut from the margin of the skull, and therefore did not belong to the specimen proper. There was no evidence of sarcoma in it.

Lannelongue, in his book ("Affections Congenitales, Tete et Cou," 1891), refers to several cases under the heading of "Teratomes de la face." Not one of them exactly corresponded with the present case. The nearest were said to have sprung from the body of the sphenoid, or the base of the skull generally, and to have protruded into the nose, mouth, and pharynx, more rarely into the cranium itself. A large proportion of the cases were typical dermoids, but these must be arranged in a separate class.

There is only one specimen in the teratological collection here (Royal College of Surgeons of England). It is a fœtus with an enormous lobulated

tumour protruding from the mouth. On the tumour portions of an upper and lower lip with a single nostril can be made out. The rest of the mass has a fibro-vascular structure with cysts containing bones, etc.

Dec. 14, 1895. J. H. TARGETT.

DR. J. W. BALLANTYNE'S REPORT.

Through the kindness of Mr. Rutherford Morison and Mr. J. H. Targett, I have been able to examine the photographs and drawings of the case, along with sections of the tumour itself, and at the request of Mr. Morison I make the following Supplementary Report:—

The mass removed from the child's face is evidently, as Mr. Targett remarks, a teratoma, or rather, perhaps, it is teratoid in character, for it contains only teeth and mucoid tissue to indicate its fœtal origin. Such a description of it, however, does not tell anything of its mode of origin. It can scarcely be identified as an instance of epignathus, using that word in the only sense in which it has yet been applied. Ahlfeld, for instance, has defined this monstrosity as any case in which an acardiac amorphous is attached to the buccal cavity, and usually to the palate of the twin fœtus; but it must be admitted that Ahlfeld himself does not strictly adhere to his definition, for he includes some instances in which the mass was adherent to the outer surface of the jaws. Taruffi gets over the difficulty by making two varieties—one, endoprosopus amorphous, which corresponds with the epignathus of Saint-Hilaire, and in which the mass grows from the inside; and the other, exoprosopus amorphous, in which it is attached externally. Mr. Morison's specimen might, therefore, be called one of exoprosopus amorphous (although it does not resemble exactly any of the previously reported cases in this group). Of course, if this nomenclature be adopted, it practically means the acceptance of the theory that the mass on the external surface of the face is an aborted twin fœtus, a rudimentary parasite.

Mr. Morison states that he has a difficulty in accepting this view of the case. In his letter to me (April 21, 1896) he says: "It seems to me that a supernumerary superior maxilla would be as reasonable an explanation of the tumour as to say it was an included fœtus of which only the maxillary processes remained." Of course the same objection may be made to the method of classification which places infants with supernumerary digits amongst the parasitic double monstrosities, for it might just as well be said that in them all that remains of the included fœtus is the extra finger or toe. It does seem ridiculous; but it must be regarded as an exigency of the classification which demands the artificial breaking up into groups of a series of specimens which, if we knew all the links, would form a continuous chain. As it is, there are always intermediate or connecting types for which it is difficult to find a place in any scheme of classification, and of such is Mr. Morison's specimen. The typical double monster, such as the Siamese twins, is connected with the case in which the only sign of duplicity is an extra finger, toe, or jaw, by a long succession of varieties all differing slightly from each other, whilst the terminal members of the series, of course, show no resemblance at all. In this way the views of Mr. Targett and Mr. Rutherford Morison may be reconciled. The mass may be regarded as a teratoma, as an exoprosopus amorphous, or as an accessory upper jaw. Of course it is not supposed that a whole twin embryo at one time existed, and that all of it save a part of its upper jaw was destroyed; rather are we to think that the tendency to duplication showed itself only in the upper jaw, which threw out a bud or rudiment of an accessory maxilla. Cases of more or

less complete accessory maxilla (upper and lower) are well known to teratologists, although their occurrence is rare. In a case reported by Israel there was found attached to the outer surface of the left side of the lower jaw a supernumerary mandible, consisting of a bone containing tooth germs, a cystic mass, and a rudimentary mouth. In a similar way we may regard the tumour on Mr. Morison's little patient's face as a rudimentary superior maxilla containing incisor tooth germs, and consisting partly of bone, partly of cartilage, and partly of fibrous and mucoid tissue, whilst the ridge round the tumour may perhaps be identified as an attempted formation of a mouth. If this be indeed its true nature, then it would fall to be included in a group established by Gurlt to include one known specimen in the calf, and termed "heterocephalus epignathus," or, to use Taruffi's nomenclature, "pleo-epignathus asimmetrus." But whether it is thus named and classified or not, the case still deserves the epithet of unique in at any rate the human subject.

June 10, 1896. J. W. Ballantyne.

1897

A TONGUE CASE.

(*Northumberland and Durham Medical Journal*, 1897, p. 25.)

Mr. Morison showed an unmarried woman, 28 years of age, with an ulcer on the left side and near the tip of her tongue, about the size of a shilling piece, for diagnosis.

The history she gave was that it was of two years' duration, and she thought it might have arisen from the irritation of biting off thread ends, which she often did, being a dressmaker. Except that she was anæmic, her health was good. The ulcer was raised from the surrounding surface of the tongue, its floor was covered by small papillomatous-looking dry granulations, its edges were sharp and well defined, and beyond the edge of the ulcer a sharp line of pale mucous membrane, apparently raised by something underneath it, could be seen. The ulcer was somewhat sensitive, but not markedly so, when handled; its base was well defined and hard, yielding such a sensation as a portion of playing card buried in the tongue might give. There was an indefinite feeling of resistance in both submaxillary regions, but no definite enlarged gland could be felt. She had no skin eruption, no sore throat, no cicatrices elsewhere, and there was nothing in her general history to aid the diagnosis. He thought it was an epithelioma.

(The portion of growth excised has since been examined by Dr. Bolam. It is a typical epithelioma.)

PATIENT AND SPECIMEN OF FRACTURE OF RADIUS BETWEEN PRONATOR AND SUPINATOR MUSCLES.

(*Northumberland and Durham Medical Journal*, 1897, p. 120.)

Mr. Morison showed a boy, 16 years of age, who had sustained a fracture of his forearm six weeks previously. The prone position of his hand, when his forearm was held forward, at once attracted attention. A radiograph (exhibited) showed a transverse fracture, in apparently good position, about the middle of the radius. The patient could only supinate his hand to a very limited extent, and consequently the usefulness of his arm was much impaired. Mr. Morison showed in connection with this case a dissected specimen of fractured radius in the same situation. On examining the specimen a fracture was seen about the middle of the radius, between the pronator radii teres below and the supinator brevis above. A fracture in this situation resulted in supination of the upper fragment by the biceps and supinator brevis, and pronation of the lower fragment by the pronator radii teres and pronator quadratus, and in the specimen exhibited the supination of the upper and pronation of the lower fragment was very marked. The importance of recognizing this fracture was considerable, for if the

forearm was 'set' in the ordinary way—thumb pointing up—a crippled arm resulted. The lower fragment must be forcibly supinated to bring it into line with the supinated upper fragment, and this could be done by 'setting' the forearm vith the palm of the hand pointing directly upwards.

ERASION OF THE KNEE.

(*Northumberland and Durham Medical Journal*, 1897, p. 49.)

Mr. Morison thought that the reason why so few tuberculous joints were operated upon in the Infirmary now was that his colleagues, the assistant-surgeons, and himself believed that rest gave results more satisfactory than operation did, and they kept the tuberculous joint cases for out-patient treatment. There were few tuberculous joints, he believed, which would not get well with careful treatment, and without operation, provided proper mechanical means were used to secure complete rest to the diseased joints. It was not uncommon, also, to see cases recover with complete return of joint function, even after some amount of suppuration had occurred in the joint. He limited operation in ordinary cases to dissecting out as completely as possible any abscess which might form, and closing the wound entirely without drainage.

DISCUSSION OF SUPPURATION IN THE ANTRUM.

(*Northumberland and Durham Medical Journal*, 1897, p. 123.)

In the discussion Mr. Morison related the case of a patient who had been under an anæsthetic for the extraction of a number of teeth and stumps from his upper jaw. Everything healed soundly except the socket of the canine tooth, which continued to discharge pus. After some months pain in the face was complained of. A probe passed into the fistula, went easily into the antrum and allowed of the discharge of some pus. Mr. Morison then suspected that the dentist had pushed the canine stump into the antrum, and suggested an operation for its removal. A small drainage tube was stretched tightly on a probe, and about $1\frac{1}{2}$ inches of it was passed by this means into the antrum. Two days later the drainage tube had disappeared and could not be found (the patient felt sure he had swallowed it). A larger size was then introduced in a similar manner and secured by a silver wire passed round the next tooth. In a few days a larger, then a larger, could be passed, until an opening the size of a threepenny-piece was painlessly secured. One day, whilst washing out the antrum the decayed stump of the canine tooth was recovered, but nothing was seen of the missing drainage tube. The antral cavity was searched with all sorts of forceps, differently shaped hooks, etc., and the recovery of the lost tube was almost despaired of. Unwilling to close the cavity till he was certain the tube was not there, he sent the patient to a dentist to have an india-rubber plug attached to an obturator fitted into the opening. The first thing the dentist (Mr. Somerville-Woodiwis, of West Hartlepool) did was to examine the mouth with the inevitable mirror, and he at once saw and easily extracted the tube, which was lying directly up against the front wall of the antrum, and so had eluded the instruments which were introduced back into the cavity. The lesson he learned was too useful, he thought, to be kept all to himself.

INFECTED WOUND OF THE KNEE-JOINT.

(*Northumberland and Durham Medical Journal*, 1897, p 196.)

A. N., age 19, a cutter at Usworth Colliery, was admitted into the Royal Infirmary, Newcastle, under Mr. Rutherford Morison's care, suffering from a wound of the right knee-joint of twenty-four hours' duration.

History of Accident.—When working in the pit a fall of stone occurred. He was struck on the right knee, where a large wound was inflicted. After being brought out of the pit he was taken home, and when the doctor saw him he ordered him to come into the Hospital. He was admitted twenty-four hours after accident.

Condition on Admission (Sept. 4, 1897).—Patient, a strong, healthy young man. Temperature, 101·2° ; pulse frequent, full, and strong ; bowels constipated ; face flushed ; and he complained of great pain in the wounded articulation. There was a transverse lacerated wound, 3 in. long, at inner side of right knee ; it was closed by one or two silk sutures. The joint was swollen and contained fluid. Coal dust and rust were plentiful in both wound and its surroundings.

Treatment.—Under ether House Surgeon explored knee. Wound extended through internal lateral ligament, detaching the internal semilunar cartilage from the tibia, except at the outer and posterior extremities. Wound red and contained pus. All dirt and bruised tissue removed as far as possible ; joint flushed out with perchloride of mercury (1–5000) ; semilunar cartilage stitched to the head of the tibia ; iodoform gauze drain ; edges of wound sutured ; limb placed on back-splint. Temperature 101·2° F. after the operation.

Sept. 5.—Temperature in morning 99·2° ; rose to 102·4° in the evening. Wound was dressed, gauze and sutures removed ; parts much inflamed, especially on the outer side. Foments of 1–1000 perchloride of mercury applied. Patient spent a very restless night, sweating freely, but there were no rigors.

Sept. 6.—Knee again dressed, joint sluiced out with 1–5000 perchloride of mercury. Temperature 100° in morning, and 101·6° in evening. Face is flushed, patient restless, perspiring freely, and joint is painful.

Sept. 7.—Temperature 101·6° in the morning ; pulse 130 ; tongue dry ; delirious at night. The man is evidently suffering from sapræmia.

Patient again given an anæsthetic. Mr. Morison made transverse incision across the knee, encircling the edges of the wound, which, together with the internal structures, were thoroughly removed, the crucial ligaments being left intact. Cartilaginous surfaces of the bones painted with pure carbolic acid ; joint sluiced out with 1–1000 perchloride of mercury, lightly packed with iodoform gauze ; temporary sutures through the skin, loosely tied ; antiseptic dressing applied ; limb supported by Gooch splinting packed with absorbent wool.

At the close of the operation the patient was collapsed. One and a half pints of normal saline were injected into the median basilic vein ; gr. $\frac{1}{20}$ of strychnine injected hypodermically.

He complained of great pain when he recovered from the effects of the anæsthetic, and was given two injections of strychnine and morphia.

Sept. 8 and 9.—Wound dressed ; man improving.

Sept. 10.—Wound dressed, gauze removed. Since the second operation the temperature has been of mild septic type, never rising higher than 102° in the evening, and gradually diminishing.

Sept. 14th.—Temperature, 101°; pulse, 102; man improving.

Subsequent Progress.—Wound is healing; man's condition is now sufficiently good to justify a favourable prognosis, though the case is still under treatment.*

CASES OF CURED TUBERCULOUS AND SEPTIC ELBOW-JOINTS.

(*The Northumberland and Durham Medical Society: Reported in Journal*, October, 1897.)

Mr. Morison showed two cases in which he had operated on the elbow-joint. He had hoped to show more examples, but the patients were evidently detained by the bad night. These two, however, illustrated sufficiently well what he had to say.

Both of them were admitted with putrid sinuses opening into their tuberculous elbow-joints. Neither of them had had the ordinary classical excision operation performed on him, as could be seen by the scar of the incisions. The boy's wound had healed entirely by first intention, without drainage and without change of dressing. The man had his wound packed with iodoform gauze and brought together by temporary sutures, which were tied when the packing was removed, and his wound had, except where too much skin was necessarily excised, healed by first intention.

Case 1.—A boy, age 16. Seven weeks before his admission to the Infirmary the patient was sliding down the bannister of a railway stair, and felt a crack in his elbow. From that time he felt pain at night, and the pain gradually grew worse. Soon after the pain commenced his elbow swelled and poultices were applied. An abscess burst on June 24, and he was admitted to the Infirmary on the following day. On admission the diagnosis of septic tuberculous arthritis of the elbow was made.

Operation (July 1, 1897).—The whole interior of the abscess sac was exposed by a long irregular incision, extending from the lower one-third of the upper arm over the upper half of the forearm, and the abscess sac was completely dissected out. Then the diseased synovial membrane was excised from the elbow-joint. No bone or cartilage was removed. The wound was washed with normal saline, dried, and sutured with catgut, leaving no drain.

After-progress.—The dressing was not removed for ten days, as no pain was complained of, the temperature was normal, and there was no discharge visible on the bandages. On removing the dressing the entire wound was found to have healed, with the exception of a small angle of skin which had sloughed but was dry. In a month the whole had healed.

Now, three months after the operation, without seeing the scar it would be difficult to say that anything had ailed the arm. The movements of the elbow-joint were scarcely less than perfect. and all signs of disease had disappeared.

* *He recovered, with a stiff knee.*

Case 2.—A man, age 21, a blacksmith. He had been operated upon in the Infirmary, in March, 1897, for an abscess of the elbow, which he says was scraped. The wound never healed, and he had since suffered severely from pain in the elbow-joint. He was re-admitted under my care on July 10, 1897, with a stiff elbow and a discharging sinus below the olecranon. The diagnosis made was septic tuberculous arthritis of elbow.

Operation (July 13, 1897).—The skin surrounding the sinus was enclosed by an elliptical incision and the sinus excised. It led into the elbow-joint. The incision was then carried upwards into the upper arm, along the line of, and posterior to, the external intermuscular septum, for about three inches, also at the upper end through the skin transversely. The triceps was then fully divided transversely about 2 in. above the insertion, and the elbow-joint freely exposed by turning the skin and muscle flaps downwards and inwards. The lower end of the humerus was entirely denuded by disease of its cartilage, and was soft and crumbly. The trochlear surface was hollowed out by an abscess cavity. The lower end of the humerus was consequently turned out of the wound and sawn off just above its articular extremity. The upper ends of the radius and ulna were next denuded of the loose softened cartilage which covered them, and the whole of the synovial membrane of the joint was carefully dissected away. The wound was then well washed with corrosive lotion, and dried. The transverse incisions through triceps muscle and skin were brought into accurate apposition by deep-buried and superficial sutures of catgut, and the wound cavity was packed with iodoform gauze. The long wound had silkworm gut introduced, and loosely tied over the gauze.

After-progress.—On the fourth day the dressings were removed and the iodoform gauze packing extracted. As, judging by the absence of pain or constitutional disturbance or pus, the wound was no longer infected, it was as completely closed, by tying the temporary sutures, as the excision of the infected skin allowed. Ten days later the wound was re-dressed and the silkworm gut sutures were taken out. The whole of the wound, except where the skin was absent, healed by first intention. It is now exactly three months since the operation, and the entire wound has been healed for five weeks. The arm is painless and is daily growing stronger. There is as yet no free movement at the new false joint, but judging by what there is, and the result of a similar case operated upon two years ago, his arm will soon be so useful as not to interfere with his performance of the hardest work.

His chief object in bringing forward these cases was to show the importance of a proper knowledge of anatomy and physiology and the principles of surgery to operating surgeons. He believed that by none of the ordinary formal operations of the text books could these patients have been satisfactorily treated. In making such extensive incisions, the anatomy of the parts required the fullest consideration, for division of important structures, especially muscle nerves, would lead to failure, partial or complete. In making the transverse section of the triceps, doubtless the nerve supply to its lowest fibres was cut off, and he would like to know what happened to a muscle in such circumstances. It seemed to him probable that the muscle disappeared and was replaced by fibrous tissue, which would take the part of a tendon. Hence his section of the muscle as low down as possible.

In performing such operations the surgical principles to be borne in mind were :—

1. *To remove, so far as possible, all infected structures.*
2. *To use every precaution to prevent reinfection of the fresh wound.*

For both purposes very free incisions were absolutely necessary, and their direction must be guided by anatomical and physiological reasons quite as much as by purely mechanical ones. The incisions should be large enough to allow of complete inspection of every corner of the infected area, otherwise some of the infected tissue would escape observation and be left behind. A perhaps equally strong reason for large incisions was that the diseased structures could be removed by a clean dissection. In no class of surgical case was a sharp knife and clean cutting of so much advantage as in those. If the tissues surrounding any such tuberculous and septic joints were torn or bruised, it might be taken for granted that a reinfection of the wound would follow operation, and the patient would be no better off, probably not so well, as if he had been left alone. In such cases it was practically impossible to eradicate every infectious particle, and the tissues had to be trusted to deal with a small residuum. Torn and bruised tissues were not equal to this task, hence the need for clean cutting and gentle handling of them.

A CASE OF CHARCOT'S DISEASE OF THE ANKLE-JOINT FOLLOWING AN UNUNITED POTT'S FRACTURE.

(*The Northumberland and Durham Medical Society: Reported in Journal*, October, 1897.)

Mr. Morison showed a woman who was admitted to his wards for the treatment of an ununited fracture of the fibula. In addition to the fracture the ankle-joint showed the typical changes of Charcot's disease, and the patient had locomotor ataxia.

A CASE FOR DIAGNOSIS.

(*Northumberland and Durham Medical Society: Reported in Journal*, October, 1897, p. 6.)

Mr. Morison: This patient, a woman, age 37, has a child 3½ months old. Three weeks ago she cut her finger with an ordinary table knife, and wrapped around it a fresh tobacco leaf. The tobacco leaf had not been chewed, and so far as she knew was clean. She removed the leaf half an hour later, and did not apply anything further. The wound dried up in a day or two. A few days later, thinking there was some matter in the wound, she pricked it with a needle, but nothing came out. A week ago she came to the Infirmary and it was incised, some drops of blood, or fluid resembling

blood, oozing out. The tissues in the region of the wound were raised above the surface of the skin, and it has grown much quicker since being incised. At the present time there is a large rounded projection, resembling pale granulations, near the base of the index finger. The surrounding skin is not infiltrated, but is of a blue colour, with numerous distended small veins. The base of the swelling is indurated, but not sharply defined. The swelling itself is not painful. The epitrochlear gland is not enlarged, but there are some enlarged glands in the axilla.

The President expressed his interest in the case, and invited discussion.

Mr. Page suggested that it might be syphilitic, but would not express any definite opinion.

Dr. D. Drummond suggested that the growth should be removed and sections shown at the next meeting.

Mr. Martin, after reviewing the differential diagnosis from chancre and tubercle, expressed it as his opinion that the growth was a sarcoma.

Mr. Morison thought it was a chancre, but would remove it and submit sections at next meeting.

CASES OF CHRONIC ABSCESS.

(*Northumberland and Durham Medical Society: Reported in Journal*, December, 1897.)

Mr. Morison showed two patients operated upon a fortnight before the meeting.

The first case was that of a man, 30 years of age, with caries of the mid-dorsal spine and a large psoas abscess which had pointed in the groin. The abscess had been opened by an incision extending from the upper part of the thigh to the abdomen, where it ran about one and a half inches internal to the anterior superior spine of the ilium, back over the iliocostal space, and terminated at the outer edge of the quadratus lumborum muscle. The muscles of the abdominal wall were divided along this line, and the transversalis fascia, and peritoneum drawn over to the opposite side, so as to expose freely the psoas muscle and the lumbar spine. The whole psoas sheath was opened up, the contents of the abscess evacuated, the lining membrane dissected and scraped away as far as possible, the diseased dorsal bodies scraped with a sharp spoon introduced under the ligamentum arcuatum internum, the large cavity thoroughly washed out with aseptic normal saline solution and dried, and the whole wound closed completely by deep and superficial sutures. The dressing was not changed for ten days, and though union had not been ideal, there were only a few granulations left where the skin edges had not been maintained in perfect apposition. The whole of the deep union seemed to be perfect. The operation was of course a serious, a difficult, and a prolonged one, and required to be justified by its results.* He had done the same operation in five cases. The first of the five was a middle-aged woman, with dorsal caries and a large psoas abscess, operated on in the Infirmary three years ago. Her wound healed throughout by first intention, and she went out wearing a Sayres' jacket in three weeks. In three months she returned

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* *This man now* (1915) *works hard as an agricultural labourer, and has never been ill since the operation.*

to have her jacket removed. Her general condition was excellent, the wound had remained sound, and there was no trace of abscess When told that she must wear a jacket for other six months, she disappeared and has not been seen since.

None of the other four cases has been such a perfect result, but only one had been a complete failure. In that case the patient was sent home a month after the operation, with the abscess discharging freely through an opening in the wound. There have been no deaths.

He knew of no other method by which psoas abscess in adults could be treated with any reasonable prospect of success. If incised and drained, aspirated and iodoformed, or opened and washed out, it was so exceptional for complete recovery to take place, that skilled and experienced surgeons had recently advised leaving them entirely alone, as was done before the antiseptic era.

The second case was a girl, 12 years old, admitted with an immense hip abscess due to hip-joint disease pointing in the thigh, operated upon at the same time. To expose this abscess thoroughly a longitudinal incision had to be made from half-way down the thigh over the abdomen up to the back of the iliocostal space, for the pus had spread up the psoas muscle, and transversely backwards to the sciatic nerve. All of the structures from the front to the back between the anterior crural and sciatic nerves were cut through to the bone, and the abscess lining was scraped and dissected away. The hip-joint was opened, the head of the femur turned into the wound, and both femoral head and acetabulum scraped and cleansed. The cavity left was completely closed, as in the first case, by deep and superficial sutures. The patient was much collapsed and very ill for some hours after the operation, but by the following day had recovered. The wound was left undressed for ten days, when a portion of skin, the size of a five-shilling piece, under which the abscess was pointing, and which was consequently left very thin by the dissection, was found to be gangrenous. With this exception the wound was practically healed, and the deep parts appeared to be sound. In a considerable number of hip-joint abscesses he had by a similar operation secured primary union of the wounds, and the patients had remained well for periods varying from eighteen months.

Two girls, one aged 25, the other 18, with large hip-joint abscesses, are quite well after eighteen months, and it seemed fair to claim them as permanently cured abscesses. If their abscesses had been incised or drained, or treated by any other method he knew of, he had little hesitation in saying that both of them would have been either dead or dying by this time.

These patients died, not from the caries but from the abscess, which he regarded as an accident in the course of these chronic joint diseases.*

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* *I am convinced this is sound teaching.*

1898

DISCUSSION ON ETHER PNEUMONIA.

(*Northumberland and Durham Medical Society: Reported in Journal*, January, 1898.)

Mr. Morison said that thirty cases of ether pneumonia had been under his care during the past five years.

The symptoms were quite typical. The day following operation the patients complained of cough and difficulty in breathing, and in the most marked cases were quite cyanosed and sweating profusely. Mucus rattles in the trachea could be heard, but pain in the wound prevented vigorous coughing, for all of his cases had followed abdominal operation except in a single instance, one of excision of the breast.

Several of the patients were very ill, with high temperature, rapid, weak pulse, and marked difficulty in breathing, necessitating a sitting posture in bed. An abundant, frothy (frequently blood-stained) expectoration was coughed up during the first few days, and as a rule, when this could be vigorously expelled, all the bad symptoms subsided.

Dr. Drummond had reported the only death in his series, so that the affection was not so dangerous as it appeared to be.

The condition was not due to surgical sepsis. Except in one case of appendical abscess, no wound infection had occurred.

It was not due to the method of administering the ether, for it had occurred in cases treated by his own method of chloroform first, followed by ether; of the usual infirmary method of gas first, then ether; and with ether alone. It was not due to the special apparatus employed, because it had followed the use of Ormesby's inhaler, Clover's inhaler, and no special inhaler at all. His own view was that the increased secretion of bronchial mucus following ether inhalation, and the dread of coughing consequent on the abdominal wound, were the important factors in its causation. He had acted on this view, and felt sure that he had arrested ether pneumonia in its early stages by insisting that the patient should cough vigorously.

A CASE OF AMPUTATION NEAR THE SHOULDER.

(*Northumberland and Durham Medical Society: Reported in Journal*, January, 1898.)

Mr. Morison showed a man, 35 years of age, who when five years of age was severely burned on his right shoulder, chest, and arm. The scar on his shoulder had never been strong, and had broken down from time to time. Three months before his admission to the Infirmary a sore developed and had rapidly spread. When admitted he had a large fungating epitheliomatous ulcer covering the deltoid muscle, and occupying roughly the same

area. His upper arm was fixed to his chest by cicatricial tissue, which extended over that side of his chest and back and shoulder tip, and downwards beyond the elbow, which was flexed by scar tissue. His forearm was normal and strong, and as it was quite useful to him in his employment, he was anxious to have it preserved if possible. The case seemed unpromising for any sort of operation, but it was decided to excise the growth and some enlarged glands in the axilla, and to shorten the upper arm by the removal of part of the humerus, so lessening the large gap by bringing its edges together. When this operation was performed, the raw surface left remained of some size, notwithstanding the excision of four inches of the humeral shaft, but the gap did not appear so large as to make healing impossible. The dressing was left on the wound for ten days. When it was taken off a granulating surface of such a size as to be obviously incapable of healing was found. The surrounding scar, released from tension, had retracted to such an extent as to increase the raw surface to about three times its original size. The patient was then advised to part with his arm, and three weeks ago the operation was performed. An ordinary amputation at the shoulder was impossible, as the shoulder, upper arm, front of chest, and back had no skin covering. No flaps could be formed by ordinary methods. A circular incision was made down to the bones of the forearm immediately above the wrist, and a longitudinal incision carried from the middle of the upper arm down the back of the forearm to the first incision above the wrist. The humerus, and the radius, and the ulna were then dissected out from the soft parts, all of which were left. The interosseus artery was ligatured; the remaining vessels were secured by torsion. The forearm flap was then doubled up at the elbow and completely covered the raw surface. The fresh raw surface was not applied directly to the granulating surface, but a layer of aseptic gauze was interposed between the two, and temporary sutures introduced. Three days after this operation the gauze was removed and the sutures were permanently tied. Healing was now complete, except at two or three points round the edge, where there were small, superficial, granulating patches. If the patient was asked to close his fist, or to make other suggested movements, the muscles of the forearm left in the stump could be seen vigorously attempting to carry out their instructions. Tactile sensation in the stump was referred to the position which the portion of skin touched would have occupied in its old position with the forearm flexed.

A CASE OF EXCISION OF THE STERNUM.

(*Northumberland and Durham Medical Society: Reported in Journal*, January, 1898.)

Mr. Morison showed a woman, 26 years of age, who was admitted to the Infirmary six weeks previously. The disease for which she sought relief had existed for twenty-three years, since she was 3 years of age, and during that long period she had undergone eight operations, but the parts had never healed. The front of the chest was covered by a red tender scar, and was riddled by sinuses discharging pus. A probe passed into the sinuses went in deeply behind the sternum and touched bare bone. An incision was made over the costal cartilages on either side, through healthy tissues,

and the scar tissue and sinuses were left attached to the sternum. With a Hey's saw the sternum was divided above just higher than the attachment of the second costal cartilage, and below immediately above the ensiform cartilage. The costal cartilages on either side were cut about a half inch from their sternal attachments, and the whole of the diseased area included by the incision was excised. On the back of the sternum a long, narrow, deep gutter was found with particles of necrotic bone lying in it. Two sinuses in the soft parts of the anterior mediastinum were slit up and scraped, and the area exposed was cleansed as thoroughly as possible. The pectoralis, major and minor of either side, were detached from the ribs, and the soft parts were now capable of being drawn together to cover the large gap, except at its upper part, where it was left open. All the parts brought into contact had healed by first intention, but a long channel was left unhealed behind them, and discharging at a disadvantage at the upper part. Rather than run the risk of failure, the union was divided, and the wound was packed from the bottom with iodoform gauze. This had been continued up to the present time, when all that remained unhealed was a superficial granulating sore the size of a halfpenny at the upper end of the scar.

DIAGNOSIS OF THYROID SWELLINGS.

(*Northumberland and Durham Medical Society: Reported in Journal,* February, 1898.)

Mr. Morison, in commenting upon the differential diagnosis, said there was one distinguishing point that suggested itself to him. In tumours of the thyroid the swelling was one-sided, and when parenchymatous it affected the whole gland.

WOUND TREATMENT.

Being a Paper read in the Section of Surgery, at the Annual Meeting of the British Medical Association held in Edinburgh, July, 1898.

(*British Medical Journal,* November 12, 1898.)

The principles of wound treatment taught by Lord Lister have now met with universal acceptance and revolutionized surgery, but the details of wound treatment still differ in almost every surgeon's hands. Two chief methods in detail have been recognized, the antiseptic and the aseptic, the latter claiming that the comparatively simple methods of its predecessor are not equal to latter-day requirements. This opinion, I believe, to depend more upon deductions made from laboratory experiments than from clinical experience, and much as we all admire and depend upon laboratory work, none of us is prepared to deny that the final test must be made at the bedside. It has been my privilege to watch the development of the antiseptic system in Lord Lister's hands and to see the results of his treatment.

Visits to hospitals in Germany, France, Russia, and America have failed to persuade me that wound infection was less frequent with the distinguished surgeons in charge of them than in Lord Lister's cases. It is my belief that in this country at least, with the less complete control we have over our surgical work, the antiseptic system is simpler, safer, and leads to the most satisfactory results.

To state our own case, Newcastle-on-Tyne possesses the worst hospital in the British Islands.[1] It is old, overcrowded, noisy, and insalubrious, so that in two adjoining beds it is no uncommon event to see an ovariotomy and a filthy septic cellulitis. The surgical wards are always overflowing with serious surgical cases, for none but the urgent can be admitted when the supply of beds is so much smaller than the demands. All the long wards run in pairs, so that every surgeon shares his block with a colleague. One sister is in chief charge of the two wards, the result being that none of the surgeons has a staff nurse of his own. There is only one regular operating theatre, where all instruments are kept. These are common to all the surgeons, and are in the charge of a theatre nurse. Another room frequently used as an operating theatre has nothing special about it except the lighting arrangements, which have been added to make it serve the purpose. Each surgeon has for his own use only sponges, ligatures, sutures, and dressings. It has been for long and still is the custom that dressers should assist at operations. Each surgical dresser takes a turn of two months at preparing and handing instruments, threading needles, cutting ligatures, etc., during the operations. So far as possible this gentleman is enjoined to keep himself specially clean during his term of office, but there usually is so much work to be done that he has to take his share in dressing out-patients, many of them, of course, being foully septic. The surgeons have so much operating work that they cannot choose certain days for aseptic and others for septic cases. Both have to be done on the same day at as convenient times as are possible to arrange. The operating theatres and wards are open to all students and practitioners, and no questions are asked as to possible pathological specimens on their clothes or person.

These are shortly the general conditions under which my public hospital work has been done, and the statistics given under this head refer to some of the work of my first year on the full surgical staff. The second set of statistics refer to work done during the same time in a private hospital, where with one assistant and nurses trained by ourselves everything is, as far as possible, under our own supervision and control. I should like to have added statistics of operations done in private with such temporized arrangements as are possible in

[1] There is now a good prospect of a new hospital.

ordinary dwellings, but I regret to find that my imperfect records of private cases do not enable me to do so. This much only I am safe in stating, namely, that the risk of operations is materially increased when they are done at home, even though the surroundings are apparently of the most favourable character.

The ideal constantly before us has been the subcutaneous wound, and our endeavour to secure such healing as occurs in that. The procedure that I recommend and the detail in technique that I adopt can be illustrated by taking as an example a case of hernia requiring radical cure. A general examination such as would be made of the candidate for life insurance is instituted before operation is decided upon; then the usual aperient is administered.

Twelve hours before the operation the part is prepared as follows: The skin surrounding and over the seat of operation is thoroughly scrubbed with spirit soap (made by mixing equal parts of soft soap and methylated spirit together) and hot water, the hairy part being shaved.

Then the area to be cleansed is rubbed with turpentine on clean lint or flannel. After this comes another washing with the spirit soap and hot water, which removes all the turpentine. Asepsis is further secured by covering the whole part with a towel wrung out of 1–1000 corrosive lotion. This is maintained in position by a bandage until the operation is about to be commenced. A considerable area all round the wound is covered with towels, wrung out of 1–20 carbolic lotion. The wound is thus isolated in the centre of an antiseptic circle, and is to be so protected from contamination by blankets, clothing, etc., which are all covered with the antiseptic wrap. Instruments, too, can be laid on the towels without fear of being harmed. The operating dress I wear is a waterproof apron with elastic bands on the sleeves. It is cleaned by washing with antiseptics.

The hands of surgeon, assistants, and nurse are prepared by the same thorough washing as the patient's skin. The nails are carefully cleaned, preferably with a bone picker; then the hands are scrubbed with spirit soap and hot water, turpentine, and again with spirit soap and hot water. Finally, they are thoroughly brushed with a hard nail-brush for about two minutes in 1–1000 corrosive lotion. No one unless cleansed as the operator must touch sponges, instruments, or the neighbourhood of the wound; and if the hands of the operator or those of his assistants have necessarily been brought in contact with anything not specially purified, they are thoroughly scrubbed in 1–1000 before being used again. Immediately before commencing the operation the patient's skin is washed with 1–1000 corrosive lotion, also all hands concerned in the operation, and this is washed off with 1–10,000 corrosive lotion. Sponges, which I always use, are also wrung out of 1–10,000 corrosive lotion. The instruments have

been lying in a tray containing 1–20 carbolic lotion for an hour. The lotion in the tray is diluted with hot water to 1–60 immediately before commencing to use the instruments.

The incision is made over the inguinal canal away from the scrotum, as Kocher directs; first, to avoid structures so difficult to make aseptic as the scrotal skin; and, secondly, to have a wound the surfaces of which may be readily apposed when the operation is completed. The superficial epigastric and superficial external pudic vessels are exposed and divided between two clip forceps; they are then secured by torsion.[1] The muscles and aponeurosis are sutured with thick catgut, and the skin is tacked down to the external oblique aponeurosis by thick catgut sutures passed into the subcutaneous fat on one side of the wound, into the aponeurosis in the middle, and out through the subcutaneous fat on the other side, at intervals of about half an inch. These sutures shut off the subcutaneous fat into a number of compartments, and prevent the formation of a large hæmatoma. The skin edges are accurately adjusted by the continuous subcuticular suture recommended by Dr. Marcy, of Boston, but of catgut, and the whole wound is closed.

Throughout the operation the vitality of the tissues is respected—rough handling, such as the so-called blunt dissection, antiseptic douching, sponge scrubbing, drainage, and the inclusion of large portions of tissue in ligatures are all avoided as far as possible. The wound is dressed with a pad wrung out of 1–1000 spirit gauze, and bandaged firmly with a dommet bandage in the form of a St. Andrew's cross over an abundant supply of corrosive wool. This dressing is not changed till the tenth day, when someone, not often the patient, is to blame if it is not healed and the catgut sutures absorbed. (Further details as to sponges, catgut, etc., I have left to be dealt with in an appendix.)

Statistics of Cases Operated upon in the Royal Infirmary, Newcastle.

Excision of Breast. (Those in which ulcer or sinus existed are excluded).—11 cases. In 10 of the cases operation was done for cancer, in 1 for tubercle. The operation performed was similar to Halsted's. All the patients recovered. It was unnecessary to change the dressing till ten days had elapsed in any case. Nine cases healed by first intention, 2 cases suppurated slightly and superficially.

Amputation of Thigh. (Primary for obvious reasons are excluded).—6. 5 recovered, 1 died. Two were done for senile gangrene. Of these 1 healed by first intention, 1 died from causes unconnected with operation with a healthy stump. The remaining 4 healed by first intention.

[1] Since I learnt from Mr. Arbuthnot Lane, of London, some years ago, the value of torsion, I have never used a ligature except in special localities like neck or axilla, or for some particular purpose.

Amputation of Leg.—5. All healed by first intention.

The dressings in all the amputations were strapped on, and left for a fortnight unchanged.

Excision of Elbow. (Cases without sinus).—5. Three were done for old injury, 2 for disease. In all the same operation was performed—namely, removal of the lower end of the humerus, a modification of Dr. Heron Watson's operation, but in disease the synovial membrane was excised in addition. Four of the cases healed *per primam* under a single dressing; 1 suppurated superficially.

Radical Cure of Hernia.—There were 70 cases, of which 55 were inguinal, 6 femoral, 5 umbilical, 4 ventral. Strangulated cases, except when the gut was resected, are included. Of the 55 inguinal cases 5 were strangulated. A radical cure by a combination of the methods of Halsted, Bassini, Kocher, etc., was performed in all. Of the 5 strangulated cases all recovered; 1 suppurated deeply and the sac sloughed; one suppurated slightly and superficially; 3 healed *per primam.* Of the 50 cases admitted for radical cure all recovered; 3 suppurated deeply, and the sac sloughed. In 7 slight suppuration occurred; 40 healed *per primam.* Six femoral cases were submitted to radical cure. One was strangulated. All recovered. One, not strangulated, suppurated deeply, 5 healed *per primam.* Five umbilical: 2 were strangulated; 1 of the strangulated cases died on the eighth day after operation of septic peritonitis. Post-mortem examination showed ulceration and perforation of the damaged intestine. The second strangulated case suppurated and recovered. One of the 3 radical cures died from shock the day after operation. The hernia was very large and the patient fat and feeble. The remaining 2 radical cures healed *per primam.*

The Knee-joint was Opened 8 *times.*—Once for removal of a piece of steel; 5 for excision of loose cartilages; 2 for suture of recent fractured patella, (transverse incision, bone and aponeurosis sutured with catgut.) All recovered. All the 8 cases healed *per primam* under one dressing.

Excision of the Knee-joint (excluding sinus cases).—6. In all, the limb was put up in two lateral Gooch splints, and the dressings were left undisturbed for a fortnight. Five of them healed and were sent home during the third week in poroplastic and starch bandage. The sixth healed slowly without suppuration.

Abdominal Section.—(Pus cases, cases in which any part of the gastro-intestinal track or vagina was opened, or such as were drained—for I usually drain through the vagina—are excluded.) There were in all 51 cases.

Ovariotomies.—16. All recovered. Pedicles were tied with catgut; 15 healed *per primam,* 1 suppurated superficially.

Ectopic Gestations.—4. All recovered, healed *per primam.*

Other Conditions.—19. Of these, 1 died after exploration for malignant growth occluding the bile duct; 1 died after exploration for intestinal obstruction due to multiple malignant growths; 1 died after operation for intestinal obstruction due to a band; 1 died after the operation for the reduction of an intussusception. Post-mortem examination failed to reveal evidence of sepsis in any of these cases. One died after the operation for the removal of a large pedunculated sarcoma of the uterus adherent to intestines. This patient died from septic peritonitis. Post-mortem examination showed scattered nodules of growth in abdomen, and some damaged but not leaking intestine. One died after an operation for the removal of adherent and inflamed tubes and ovaries from septic peritonitis. The patient had chronic puerperal salpingitis and ovaritis, but as no pus

was found, the abdomen was entirely closed. The case had been included, though it appears to me that the infection was brought about by the disturbance of the contents of the patient's own pelvis. The remaining 13 recovered. One coughed open his wound on the twelfth day after operation, when it appeared to be healed. His intestines were replaced. The wound suppurated superficially when closed on the second occasion. Twelve healed per primam.

Removal of Uterine Fibroids.—In 3 the tumour with fundus and appendages were removed, leaving the cervix as a stump. All recovered and healed per primam. In 1 myomectomy was performed. The patient died suddenly and unexpectedly the day following operation. Necropsy showed nothing wrong in the abdomen.

Ventrofixation for Uterine Prolapse.—2. Both recovered and healed per primam.

Hydatid of Liver in child of 6 size of football. All the tumour, except a portion of the fibrous capsule, was removed. Abdominal wound entirely closed. Healed per primam.

Nephrectomy.—2. For malignant tumour. Both recovered; 1 healed *per primam*; 1 suppurated superficially.

Nephrolithotomy.—2. Both recovered; 1 suppurated; 1 healed without suppuration in 14 days.

Exploration of Kidney for Stone.—1. Died next day. Post-mortem: No stone; advanced cirrhotic kidneys.

Statistics of Cases in Private Hospital.

Excision of Breast.—10. All recovered. All healed by first intention.

Excision of Elbow (for Old Injury).—1. Healed by first intention.

Radical Cure of Hernia.—8; 5 inguinal; 3 ventral. Of the 5 inguinal, 4 healed by first intention. One wound was opened partly to let out contents of a large hæmatoma. It was allowed to granulate, but it did not suppurate. Of the 3 ventral, 1 healed by first intention. In 1 the superficial sutures gave way at lower end of wound on account of severe coughing; 1 died on the fourth day jaundiced, cirrhotic liver.

Excision of the Knee.—1. Healed by first intention.

Abdominal Section.—22; 21 recovered; 1 died.

Ovariotomy.—13; 12 healed by first intention; 1 suppurated superficially.

Hysterectomy.—3; 2 healed by first intention; 1 died on seventh day, very large fibroid. Post-mortem: Nothing wrong in operation area; pus in one kidney and ureter.

Other Conditions.

Ectopic Gestation.—1. Healed by first intention.

Intestinal Obstruction.—1. Healed by first intention.

Tumour of both Fallopian Tubes.—1. Healed by first intention.

Exploration.—3. Two healed by first intention; 1 suppurated.

It appears to me reasonable to suggest that the antiseptic might compare more favourably with the aseptic treatment if wounds infected before or unavoidably infected by disturbed foci in the patient had been selected for statistical purposes, instead of those I have chosen, but the difficulties of doing so would be very much greater than the task I have undertaken.

Summary.

The antiseptic method, if contact of strong antiseptics with raw surfaces be avoided, allows of ideal wound healing.

In an uninfected wound no drainage is necessary.

For the arrest of hæmorrhage, torsion should replace the ligature in the great majority of cases.

Buried catgut sutures are the best for securing apposition of the deeper structures and the skin, for by their use dead spaces, stitch-abscesses, and the pain and trouble of removing sutures may be avoided.

All clean wounds should be left undisturbed for ten days, and should then be healed.

The special dressings described are those I have been using of late years, but it is of interest (to me at least) to recall that as early as 1878, in a paper read before the South Durham and Cleveland Medical Society; again in 1881 in the *Birmingham Quarterly Review*; and again at the February meeting of the Northumberland and Durham Medical Society, in 1886, I advocated the same principles, and reported results of many major operation cases healed under one dressing, and I then maintained that this should be the rule. So far as I can learn, no one else had suggested such possibilities in 1878 or for many years later. At the present time the majority of surgeons aim, with success, at getting wounds healed under one or two dressings.

Appendix.

Operating Table.—No special table is necessary. An ordinary strong deal table, not too broad, serves every purpose. For the Trendelenburg posture, I draw the patient down the table, till the knees are hanging over its lower end. By fixing each ankle of the patient to a leg of the table, raising the corresponding feet of the table on two chairs, this position is secured. The operator requires a small stool to stand upon.

Table for Instruments.—Metallic and glass implements are an unnecessary luxury; nothing beats a deal table, covered by a table-cloth wrung out of 1–20 carbolic lotion.

Operation Dishes are thoroughly cleaned in the ordinary way, and before use are washed inside and out with 1–1000 corrosive lotion.

Nail Brushes are kept in lidded jars in 1–1000 lotion. Cheap wooden ones with strong bristles are best, for there will be no hesitation in destroying them when not above suspicion.

*Sponges** may be a frequent cause of mischief, and require great

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* *Gauze mops now replace sponges.*

care and attention. When new they are well shaken and beaten in a mortar if necessary, to remove as much of the calcareous matter, sand, etc., as possible; next they are soaked in acid water (strong enough to taste distinctly acid) for about four hours, or, at any rate, till all effervescence has ceased; then they are thoroughly kneaded in a solution of carbonate of soda (half a pound to 3 quarts) over and over again; after this they are thoroughly washed in clean water, and finally put in carbolic lotion (1–20), where they are kept. When required for use outside, they may be separately wrapped up in gauze wrung out of (1–20) carbolic lotion, and then can be conveniently carried in a clean waterproof sponge bag. When soiled they are frequently washed in warm water first, then steeped in carbonate of soda solution for twelve hours, again washed in warm water till quite clean, and finally put into a jar of (1–20) carbolic lotion.

Instruments are thoroughly washed with soft soap, hot water, and a nail brush; then they are immersed in 1–20 carbolic lotion for one hour before the operation. When dirtied they are washed and brushed whilst still moist, and then dried thoroughly before being put away. They are kept lying on glass shelves in a well-made case.

Ligatures and Sutures.—For nearly every purpose I use catgut, which is bought preferably old, well soaked in carbolic oil. It is transferred from this carbolic oil to ether, in which it is well shaken, and in which it is allowed to lie soaking for some hours (usually over night). From this it is transferred to corrosive sublimate and spirit 1–1000, where it is kept till required.

Towels are boiled for half an hour and steeped in 1–20 carbolic.

Dressings.—The gauze that I use is bought at a draper's, and boiled for an hour. It is then put into and kept in jars of corrosive sublimate and methylated spirit (1–1000) till required. Before applying it to the sutured skin it should be wrung out of the spirit-corrosive fairly dry. Hartmann's corrosive wood-wool wadding forms the outer dressing. It is kept in well-fitting metal boxes. For the purpose of keeping dressings fixed, I employ fairly broad bands of adhesive strapping and elastic webbing bandages outside of the ordinary bandage, which must be firmly applied to keep the deep surfaces of the wound together and to limit exudation.*

** Though I still use antiseptics for towels and instruments, both are also sterilized by heat, and I wear sterile overalls, sleeves, gloves, cap, and mask.*

A SERIES OF CASES OF FRACTURE OF THE TIBIA AND FIBULA.

(*Northumberland and Durham Medical Society: Reported in Journal,* December, 1898.)

During the last year a large number of cases of fracture of the tibia and fibula have been treated in my wards. Dr. Arnott wrote to twelve of these patients, who lived in Newcastle, asking them to come to-night. Only two have put in an appearance. What I wished to say refers to a method, so far as I know, new, of treating such fractures. Mr. Arbuthnot Lane, of London, something like a year ago, brought forward a method of treatment for fractures of the tibia and fibula by an open operation, and the use of strong screws, to bring the bones into and hold them in accurate apposition. His treatment was based upon the belief that the majority of patients with fractured legs were afterwards physically incapacitated to such an extent as to materially interfere with their activity. This view he supported by strong evidence, and challenged any surgeon who differed from him to show better results than he had described at any of the Medical Societies. His challenge was never accepted, which suggests at least that no large number of satisfactorily united legs was to be found. This I believe to be the case after the ordinary methods in use, for I have seen many ugly legs in the out-patient department of this Infirmary. The usual plan is to 'set' the fracture at once, and here the practice has been to apply two side splints and a back splint, and to keep the leg slung.

My directions to my house surgeon are to bandage the leg comfortably and firmly in two lateral Gooch splints, padded with abundance of cotton wool, and not to trouble about 'setting' at all. The patient is to be allowed to put the limb in any position he likes, and unless there is discomfort, the dressing is not to be changed for ten days. At the end of this time the dressing is to be removed, the limb is to be well rubbed, and, with the other as a pattern, is to be moulded into a shape as like it as possible. When the bones have been straightened and the shaping has been made satisfactorily, a plaster-of-Paris bandage is to be applied and the patient sent home.

It has only been found necessary on one occasion to use an anæsthetic for the reduction, which is usually by this time easy and painless. The muscles are flaccid; the soft callus aids reduction and retention, when the pain and tenderness resulting from the injury have subsided.

I regret that Dr. Arnott and I have so few patients to show, but it is not our fault. An examination of the two patients who have come will satisfy you that we do get some good results. The elder man's injury is of too recent date to show the functional results, as his leg has just been taken out of the plaster-of-Paris bandage. In both the union is straight, and the deformity just discoverable. The younger man, whose fracture occurred six months ago, will tell you that his leg, so far as he knows, is as good as ever it was, and that he can do anything in the way of running, jumping, bicycling, or work, as well as he did before the accident. This I must ask you to believe (for I have seen many of the cases after recovery) is not exceptional, but the usual result since I have adopted the method of treatment described.

1900

IODOFORM POISONING.

(*Northumberland and Durham Medical Society: Reported in Journal.*)

Mr. Rutherford Morison described the symptoms of iodoform poisoning as being—a red and dry tongue; dark rings around the eyes; a rapid pulse, pyrexia; delirium or mild maniacal symptoms. In his own experience poisoning had most often followed its use after the operation of nephrectomy.

A CASE AFTER REPAIR OF DIVIDED TENDONS.

(*The Northumberland and Durham Medical Society: Reported in Journal*, 1900, page 29.)

Mr. Morison showed a man, age 23, who had had all his extensor tendons divided by a knife at the junction of the lower with the middle third of the forearm. The divided tendons had been carefully isolated, identified, and sutured with catgut. The limb was then kept at rest in a splint for six weeks. The result now shown was perfect individual movement.

A CASE AFTER EXCISION OF EPITHELIOMA OF THE BLADDER.

(*The Northumberland and Durham Medical Society: Reported in Journal*, 1900, page 29.)

Mr. Morison: This woman, age 48, had suffered from hæmaturia for ten months, with some pain above the pubes. Cystoscopic examination revealed an ulcerated surface, and per vaginam a hard nodule was felt in the bladder wall. The diagnosis arrived at was that of epithelioma of bladder. On suprapubic exploration, the epithelioma was found to occupy the left side, extending on to both anterior and posterior walls. The bladder was now packed with gauze, and the patient having been placed in the Trendelenburg position, the incision was extended so as to open the peritoneal cavity.* The peritoneum was now stripped off the surface of the bladder in the vicinity of the area involved, and the ulcer excised freely—the portion of bladder wall removed being the size of two florins. The opening in the bladder was now closely sutured, and a drainage tube inserted through the floor of the pelvis into the vagina. No leakage occurred. The wound healed quickly, the patient going out of hospital in two weeks. She has had no subsequent symptoms.†

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* *So far as I know this had never been done before.*

† *She died two years later of recurrence in the abdomen.*

1901

A NEW OPERATION FOR POPLITEAL NECROSIS.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1901, p. 47.)

Mr. Rutherford Morison pointed out how difficult these cases were to cure because of the deep-seated position of the sequestrum, and he illustrated this point by reference to a specimen which he showed to the meeting. In order to overcome the difficulties, he had divided the femur obliquely from before backwards and above downwards, just above the suberural pouch, and had then found no difficulty in removing the sequestrum. He made a horse-shoe flap of skin and turned this down; he then divided the extensor tendon transversely, exposing the bone. The section of the latter was made obliquely so as to prevent the backward displacement of the lower fragment which would otherwise occur. After division, the section was opened up transversely and the bone was thoroughly explored. The femur was put in position and the muscle sutured with catgut. The whole limb was put up in two lateral Gooch splints, and subsequently in plaster.

The operation was illustrated by means of a femur divided after this method.

The sequestra exhibited had been removed from the boy shown. He had performed this operation in two cases, and Mr. Turner had done it in one case at his request. These cases had all done well.

Case.—Boy aged 12. Had osteitis of lower end of right femur. He was twice operated on during the acute stage by incision on the inner side, and on the last occasion the femur was trephined, but the sinus left had continued to discharge.

In August, 1899, the operation described was performed. He left hospital in December, 1899. He walked from the time he left hospital, and has been quite well since.

Present Condition.—The boy is perfectly well. The scar of the old sinus and of the operation is sound. There is a little thickening of the lower end of the femur. The movements of the knee-joint are perfect. There is no shortening or other deformity. The boy walks so well that it is impossible to tell which was the defaulting side. The divided extensor muscle is as strong on the side operated on as on the sound one. (This was tested by means of weights.)*

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* *This is a severe operation, and should only be performed when other measures have failed. It is then excellent.*

RECURRENT CARCINOMA OF THE BREAST TREATED BY REMOVAL OF THE OVARIES AND THYROID EXTRACT.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1901, p. 34.)

M. B., age 33. Admitted to hospital with a large carcinoma of the right breast of eight months' duration. The skin was extensively involved, but not ulcerated. A gland could be felt in axilla. There were no signs of dissemination.

On November 6, 1900, the complete breast operation—excision of both pectoral muscles and axillary fat—was done. Incision healed per primam.

Microscopically, growth was carcinoma of the scirrhus variety.

Twelve weeks after operation a local recurrence appeared, and rapidly spread along the line of incision. No signs of distant dissemination.

On March 6, 1901, she was re-admitted and double oophorectomy performed. The ovaries were normal.

After operation she was transferred to Dr. Murray, and was treated by thyroid extract. As a result the nodules almost disappeared, but six weeks after leaving the hospital recurrence again took place. At the present time she had a very extensive local recurrence.

Mr. Morison thought in these hopeless cases oophorectomy should be performed, as good results had occurred in some cases.

Messrs. Wardale, Richardson, and Angus gave their experience of treatment by oophorectomy and thyroid extract. The results had been the reverse of satisfactory.

FRACTURE OF PATELLA.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1901, p. 48.)

Mr. Morison brought forward cases, for the notes of which he was indebted to Mr. Turner, to illustrate some points which had interested him in the treatment of fractured patella.

The first point to which he would like to draw attention was the question of what cases should be operated upon. He operated upon all cases of transverse fracture, with separation of the fragments, in persons of fair health, of not advanced age, and in all compound fractures.

The second point was the method of the operation. He turned up a horse-shoe-shaped flap from below and fully exposed the front of the knee-joint. It was rare to find the fractured bony surfaces bare. A curtain of the torn aponeurosis nearly always had fallen over and covered up the broken surface of the upper fragment. This was the chief obstacle to bony union, and except by the open method of treatment it could not be removed. The fragments were drilled and fastened together with either one or two thick catgut sutures. He

did not regard a permanent suture such as wire an ideal substance for surgical use.*

Absorbable sutures should replace all others when possible. Hence his use of catgut. In addition to the bone sutures the torn aponeurosis was sutured with thick catgut.†

The whole operation, with the exception of the tying of sutures or ligatures, was performed by instruments; with the exceptions mentioned, no fingers were allowed to touch the wound. The open joint and wound were not irrigated, and were not interfered with by sponges more than was absolutely necessary. The wound was entirely closed by catgut skin sutures, and the whole limb put up in two lateral Gooch splints.

The dressings and splints were left unchanged for from ten to fourteen days, when they were taken off.

A permanent dressing of two lateral poroplastic splints, covered by two or three layers of starch bandages, were then applied, fixing the joint firmly for another month.

This brought him to the third point that he wished to emphasize.

Early movement had all along been advised in the treatment of these fractures. If it was essential, the wire suture was; it would not be safe to move the knee-joint at the end of ten days if the patella was only fixed by catgut. He believed that early movement was not essential, and that massage was a luxury, and this opinion was strengthened by an examination of the cases exhibited, which were the only ones he had treated by this method.‡

CASE 1.—R. N., age 24. Accident in November, 1897. Operation four days after accident. Was in splints in hospital twenty-four days. Was in plaster for three months. Four months after operation went to work, and has worked ever since.

Present Condition.—Patella firmly united. Movements of knee-joint perfect. When he walks it is impossible to tell which is the defaulting knee. Working regularly as a labourer.

CASE 2.—B. B., age 35, accident in June, 1898. Operation six days after accident. Limb was three weeks in splints in hospital; four weeks in poroplastic. Nine weeks after operation he went to work, and has worked regularly since.

Present Condition.—Patella firmly united. Movements of knee-joint perfect. When he walks it is impossible to tell which is the injured knee. He works regularly on a tug-boat.

CASE 3.—A. C., age 40. Patella broken by muscular violence in

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* *Wire was the only suture recommended then.*

† *This is almost, if not quite, as important as the bone suture.*

‡ *This view has recently been expressed by other surgeons.*

July, 1900. Operation performed seven days after accident; fragments united with catgut. Left hospital eighteen days after operation with a poroplastic splint. Splint removed seven weeks after operation. Started work twelve weeks after operation, and has worked regularly since. He is now coal-hewing*.

Present Condition.—Perfect result. Movements complete; no limp.

Case 4.—T. R. C., age 47. Patella broken by indirect violence. Operation August 14, 1900, eleven days after accident. Patella sutured with catgut. Left hospital seventeen days after operation with knee in poroplastic. Splints removed in six weeks. From time splints were removed he has moved knee; has not yet been to work. He fell on the injured knee a week ago, and since then it has been a little painful.

Present Condition.—Patella firmly united. Almost complete flexion and extension.

Case 5.—W. T., age 22. Patella broken by indirect violence. Operation November 6, 1900, six days after accident. Patella united with catgut. Left hospital fourteen days after operation in splints.

Present Condition.—Splints just removed, incision perfectly healed; a little flexion and extension. Patient sent away without any dressing or splints, and told to use the joint carefully.

** This is hard work, necessitating complete use of joint. I still perform the same operation by the same methods in recent fractures, and have had no imperfect result.*

1902

A DISCUSSION ON TUBERCULOSIS OF THE TESTIS, PROSTATE, AND SEMINAL VESICLES.

(*British Medical Journal*, 1902, and *Lancet*, 1901.)

Mr. Rutherford Morison said the very excellence of the paper (by Dr. Senn, of Chicago) assured for it the widest consideration, and this induced him to record his belief that surgery was not so hopeless in these cases as might appear to be suggested by previous speakers. The natural history of genito-urinary tuberculosis, although complete recovery was unlikely, showed that it might run an extremely chronic course, and, with occasional periods of complete temporary disability, allowed of a fairly active and fairly painless life. Every symptom of the disease might disappear except increased frequency of micturition: that he had never known to leave. One point that he thought should receive consideration when operation was decided upon was this. Given a case of tuberculous disease of the testicle, prostate, and vesiculæ seminales, what operation should be done? He thought it was improbable that in such a case the whole of the disease could be eradicated from the prostate. Was it wise to try? He thought not. If all disease could be removed he would do it, but if it could not all be excised he would still hope that removal of the diseased testis would aid a 'cure.' Rest was a great element in the cure of surgical tuberculosis elsewhere, and it seemed probable that tuberculosis of the seminal vesicle and prostate would be favourably influenced by castration. He related, in support of the more hopeful view, the case of a middle-aged woman with tuberculous pyonephrosis and tuberculous ulceration of the bladder, who, eight years after nephrectomy, was in good health. In a second case he excised both testicles of a youth, 16 years of age, for septic tuberculous disease. Eight years after this the patient was in good health, and active mentally and physically.

He had never seen any good whatever come from the use of iodoform in tuberculosis. It did not cure when applied to tuberculosis of the skin. Why did it do so when hidden in the tissues by injection?

CASES.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1902, pp. 103 and 113).

Malignant Syphilis.

Mr. Morison brought forward the following examples of this condition:—

1. A girl, age 22, who had condylomata five months previously, and eighteen months ago a primary sore. She had now numerous pigmented depressed scars on the skin of the legs and thighs. There were also some punched-out ulcers about the ankles.

2. A girl, age 24, condylomata five months ago. Now symmetrical papules, squamæ and pustules over practically the whole skin surface. There were also extensive ulcerations on the shins, and scars, representing old ulcerations, on the legs and thighs.

3. A woman, age 27, who has a scar in the middle of the forehead and also on the chin. She shows squamous syphilides all over the surface of the body.

4. A girl, age 15, with a polymorphous eruption, most marked on extensor surfaces. The date of the primary chancre is unknown.

Mr. Morison, in describing the treatment he adopted in cases of syphilis, advocated inunction. For the superficial mouth and throat ulcerations he used a weak solution of chromic acid (1 grain to the ounce). For intractable ulcers and fissures he advised painting with a stronger chromic acid solution (10 grains to the ounce). To ulcers of the skin he applied a weak mercurial ointment.

Epithelioma of Throat.

Mr. Morison showed a man, aged 50, whose throat condition had at first been diagnosed as syphilitic. Now there was a large ulcer with raised and indurated edges extending from the right to the left faucial pillar across the soft palate, and completely destroying the uvula.

Varicose Ulcer treated by Thiersch's Grafts.

This man, aged 45, had a large varicose ulcer on the leg, which was septic and showed no tendency to heal. After treatment for a few weeks, with the object of cleansing the ulcer, and after scraping the superficial granulations from its surface, large Thiersch grafts were applied. At the same time the internal saphenous vein was tied at the saphenous opening. The ulcer has now completely healed.

Patient after Plastic Operation on Leg.

Mr. Morison brought forward a man who had developed an epithelioma in the unhealed scar left after a burn on the leg. The epithelioma was freely excised, a large raw surface resulting. To cover in this a flap of skin was glided down and the remaining raw surface covered with Thiersch grafts. A good result had been attained.

Patient after Removal of Sarcoma of the Tonsil.

This girl, age 22 years, had some swelling of the tonsil for three months. A short time before coming into the Infirmary the tonsil was incised under the belief that it contained pus. At the operation, after a preliminary laryngotomy, an incision commencing just below the mastoid process was carried down the anterior border of the sternomastoid for a distance of three inches. Through this incision the enlarged and infected glands were removed, and a temporary ligature was placed on the carotid. From the top of the first incision another was carried forwards to the angle of the mouth. After division of the ramus of the jaw the tonsil was enucleated from its bed.

Patient after Removal of Tumour (Sarcoma) of the Brain.

This man, age 37, had a tumour on the side of his skull the size of a pigeon's egg. He suffered acute headache, had attacks of vomiting, and

epileptiform fits which, starting in left side of face, rapidly became general. Two years and a half ago the man was trephined and the tumour removed. The symptoms promptly disappeared. Six weeks before admission into the Infirmary the symptoms returned, with, in addition, paresis of the muscles supplied by the third nerve of the right side. There was also well-marked double optic atrophy, causing complete blindness. On examining the right temporal region, a hard swelling was discovered, fixed and immovable. At the operation the temporal muscle was found to be infiltrated, and so was removed. On removing a large piece of the underlying skull and incising the dura mater, a tumour was found in the frontal lobe. This was easily shelled out. Now, although the operation was only performed three weeks previously, the headache had disappeared, and he could count fingers. On microscopic examination the growth was found to be an angeio-sarcoma.

PATHOLOGICAL SPECIMENS.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1902, p. 181.)

Mr. Morison showed a beautiful collection of specimens illustrative of various points in surgical pathology. The specimens had been prepared by Mr. G. G. Turner from cases operated on by Mr. Morison. The specimens were as follow: (1) Cyst of epididymis; (2) Duct carcinoma of breast; (3) Part of liver, gall-bladder, and cystic duct, with gall-stones in bladder and duct, removed from a fatal case of chorea; (4) Hydatid cysts; (5) Calculous hydronephrosis; (6) Vesical calculi, which had undergone spontaneous fracture; (7) Piece of catheter taken from male bladder, encrusted with phosphatic accretions; (8) Stone from kidney which had been photographed before operation by *x* rays; (9) Duodenum with ruptured ulcer. In this case Mr. Morison mentioned that, as he often found, contrary to the ordinary text-book statements, the stomach wall was thickened and contracted; (10) Two appendices: one with enterolith, the other with suppuration; (11) Two cases of malignant rectum.

REVIEWS.

(*Northumberland and Durham Medical Journal*, 1902, p. 90.)

DISEASES OF THE STOMACH AND THEIR SURGICAL TREATMENT. (BY ROBSON AND MOYNIHAN.)

This book is based upon the Hunterian Lectures of Professor Mayo Robson, who, with the help of his colleague and late House Surgeon, Mr. Moynihan, has enlarged them so that the joint authors have evolved the present volumes.

There can be no question as to the need for such a book at the present time, for the surgery of the stomach is making great strides, and is still waiting for more general acceptance; nor can there be any doubt that the exceptional experience of the authors entitles them to speak with an authority which will claim the most respectful consideration for their views. The whole profession is indebted to the two gentlemen who, from their

scant leisure, have stolen time to publish this book, and no surgeon's library is up to date without it.

We have read the book through once and again with great interest, and are in cordial agreement with the majority of the statements and views contained in it. As a guide to the diagnosis and the surgical treatment of diseases of the stomach, it may be confidently accepted as the best and the safest. The excellent illustrations accompanying the descriptions of the operations undertaken, make every detail of each so plain as to be readily understood.

Where there is so much to praise, there must, for the work is human, be some faults to find, and for the sake of future editions we will do our best to pick what holes we can in this.

There is a lack of systematic method throughout the book ; for example, we find in Chapter I., headed " Anatomical Considerations—Diagnosis "—an account of the anatomy followed by diagnosis, and this again by remarks on gastrotomy and gastrostomy.

Diagnosis here, we are led to understand, " includes a consideration of all the information which the surgeon can elicit by a physical examination " (page 7). On page 9 we find the following under the heading *Palpation* :—

" A tender and rigid epigastrium suggests ulcer of the stomach, and the situation of the tenderness is frequently a good guide to the site of the ulcer ; for instance, if the tenderness be under the left costal margin and the left rectus be rigid, especially if the patient be relieved by assuming the dorsal decubitus, in all probability the ulcer will be on the anterior surface ; whereas, if the tenderness is on the right of the middle line, between the umbilicus and the right costal margin, the probability is that the pylorus is the affected part. When there are symptoms of ulceration without marked epigastric tenderness and with increase of pain on dorsal decubitus, and relief is found by lying on the face, the probability is that the ulcer is on the posterior wall of the stomach."

We think this would have been better placed under the heading of diagnosis of gastric ulcer, when the character of the pain, when it was, where it was, and what it might mean, could have been discussed,

The same paragraph illustrates another point we have to make against the style of this book. It is natural that two such successful surgeons should write with great enthusiasm of their work and results, but there is surely too cock-a-whoop method of diagnosis adopted here.

In the matter of surgical treatment, too, the teaching assumes such optimistic form as to lead an unkind critic to enquire whether failure is ever possible. Physicians and practitioners do not always attach the same importance to recovery from an operation as surgeons are apt to do, and they ask to be told how much the patient has gained as a result of the ' successful operation ' a year later. This question has been satisfactorily answered in many instances here, but not sufficiently explicitly in some and not at all in others, in which a little trouble would have made an explanation possible.

On page 50 a statement occurs which we think will scarcely be accepted without further verification. An omental graft is advised to close openings in the stomach not amenable to trustworthy sutures.

"An experiment proved, not only that the transplantation succeeded, but that the omental tissue gradually assumed the character of gastric mucous membrane, and well-formed glands developed."

The teaching on cancer of the stomach is sound, though possibly the spread of the disease is frequently not limited to the hard-and-fast

anatomical lines which it ought theoretically to follow. The importance of early diagnosis made, if necessary, by abdominal section, is strongly, though not too strongly, emphasized. Under the choice of operation, we read that "whenever possible a radical operation should be attempted," and with this we cordially agree ; we would go further, and ask if any other operation is generally advisable, and would limit the palliative operations of gastro-enterostomy and gastrostomy to their only legitimate function—that of preventing death by starvation.

We have seen no evidence in favour of the authors' statement that "a gastro-enterostomy, by determining rest, will assuage pain and lessen the rate of growth." Nor have we any patience with the statement concerning gastrostomy for malignant stricture of the œsophagus made in this and other surgical text-books, that it "should be performed at the earliest moment after the diagnosis is assured." If there had not been, through mistaken diagnosis, an occasional brilliant result from gastro-enterostomy for supposed cancer of the pylorus, the operation would long ago have been discarded. For cancer it has been a miserable failure, and the authors' results do not lead us to modify the view which we have long held, viz., that this operation is only justified in irremediable cancers, which are causing serious pyloric obstruction. Regarding gastrostomy, our views are equally strong. The operation is not justifiable till the patient cannot swallow sufficient to keep him alive, and feels hungry. Which of us would choose to live upon milk and eggs put through a gastrotomy opening, if he could swallow the same like an ordinary mortal ? A desire for good statistics must not be allowed to weigh surgical principles too heavily down.

The chapters on gastric ulcer are, perhaps, the most valuable in the book ; but the prognosis of gastric ulcer, though supported by arrays of figures, appears to us to be unduly pessimistic, and the treatment by gastro-enterostomy unduly optimistic.

On page 116 we read : "Gastro-enterostomy, in the absence of special complications, is the operation to be relied on in the treatment of ulcer of the stomach ; it acts by securing physiological rest by means of drainage, thus allowing the ulcer to heal without being subjected to the irritation of acid secretion, accumulation of food, or frequent stomach movement. It also, while remedying the hyperchlorhydria, relieves pyloric spasm, and while preventing stagnation of fluids cures or materially diminishes gastric dilatation." The use of the term "physiological rest" here appears to us a strange misuse of terms, as it is applied to what is, probably, of all other operations in surgery, most calculated to ignore the conditions of normal physiology, and we are no more persuaded that the other reasons given fully explain the benefits following such operation, frequently, but not with any certainty, as we know to our disappointment. The treatment of intractable gastric ulcer which appeals to every surgeon is excision of the ulcer. When this is inadvisable for sufficient reasons, gastro-enterostomy should be done with the hope, borne out by some experience, that benefit may result. That, however, is not the teaching of this book. An admiration for gastro-enterostomy seems to have ousted all other thoughts, and at first sight the reported cases appear to explain this. Careful reading shows, however, that in every recorded case (pages 118–121) there was definite evidence of pyloric obstruction, and the success of gastro-enterostomy is then not difficult to understand. Before we can accept gastro-enterostomy as *the* treatment for intractable gastric ulcer, a sufficient number of cases, uncomplicated by pyloric obstruction, must be fully recorded to confirm these theories, and, until this is done, judgment should be deferred.

With regard to what is said concerning hæmorrhage from the stomach, we, in the main, concur. To aim at arresting the bleeding by direct treatment of the bleeding point is sound surgery ; but the difficulties encountered in finding this, and when found, of dealing satisfactorily with it, are, in our opinion, too lightly dismissed. Notwithstanding these difficulties and risks, we cannot but regard gastro-enterostomy as makeshift and poor surgery in the treatment of gastric hæmorrhage.

The prognosis of gastric ulcer is dealt with fully, as its importance deserves.

Under differential diagnosis in mentioning the conditions which may be mistaken for ruptured gastric ulcer, ruptured abdominal aneurysm and ruptured pancreatic cyst might be named, as we have known both to lead to a wrong diagnosis. The cases presented lead the reader kindly on to the knowledge that in some instances the most careful diagnostician may fail to make a correct detailed diagnosis, and that definite treatment has to be adopted at once on the bare knowledge that some overwhelming abdominal catastrophe has occurred, and that a fatal issue can only be averted by prompt operation. We regret to see the credit of priority in suggesting operation for perforating gastric ulcer given to Mickulicz. This is not correct, and we hope the mistake will be rectified in future editions. The surgical world is indebted to a countryman of our own, Mr. Nelson Dobson, of Bristol, for this bold, brilliant, and life-saving suggestion, and the debt must be faithfully acknowledged. There is only one criticism we have to make concerning the technique of the operation. On page 159 it is stated : " In all cases a drainage tube should be passed down into the pelvis through an incision made just above the pubes." We are not told how long a time this is to stay, or what the object of it is. It is unnecessary if the stomach contents have not run down there ; it is better replaced by a prolongation downwards of the abdominal incision if adopted for more thorough cleansing of the pelvic cavity. It is more likely to produce than to prevent peritonitis commencing in the pelvis, so that we can find no reason for this recommendation.

Writing of hour-glass contraction of the stomach, an important and interesting deduction has been made.

" The facts that pathological changes producing marked changes in the contour of the stomach may be inconspicuous, that ulceration in association with ' congenital ' deformity is not infrequent, and that in many of the examples no purposeful examination of the specimen has been made, warrant us in saying that congenital hour-glass stomach is certainly rare, and not improbably mythical."

In a valuable paper written by one of the authors (Moynihan) subsequent to this, the same conclusion has been so ably advocated, and such abundant evidence has been advanced in its favour, that proof of a congenital origin of hour-glass contraction must be required before such an explanation can be accepted.

In their treatment of stricture of the pylorus, the authors still keep a place for dilatation, either from within after opening the stomach, or from without by invaginating the stomach wall. Pyloroplasty has, in our opinion, rendered both obsolete, and is, as we have found, to our own satisfaction, at least, the best treatment for all cases in which it is possible to do this operation. We have experienced no such disappointments from it as the authors mention, and feel sure that in replacing it by gastro-enterostomy they have not chosen the better part.

Mr. Robson's name is well known as the discoverer of the importance

of adhesions as a cause of stomach troubles, and there can be no doubt that serious symptoms may arise from kinking produced by such, causing definite pyloric or duodenal obstruction. These conditions, however, are extremely rare in our experience, and we cannot but regard an operation as incomplete which deals only with adhesions. If gall-stones are the cause, the removal of the gall-stones alone may be relied upon to remove the symptoms—the adhesions which have been left uninterfered with will produce no trouble, however extensive.

On page 226 the following sentence occurs: "We have heard it asked, 'What is the use of simply detaching adhesions?' Fortunately, our experience in this class of cases is sufficient for us to give a very direct answer to this query, for we can point to many cases of cure where men and women, formerly invalided by pain and dyspepsia, are now leading active and useful lives. Slight adhesions we are accustomed to separate with the fingers, firmer bands to divide between ligatures, going carefully to work until the pylorus is quite free. Where the omentum is available, we usually bring the right border upwards, and leave it between the pylorus and the gall-bladder and the liver, so that, should any adhesions form again, they will be in the form of a loose mesentery, and not binding, like adhesions to fixed organs."

On two points here we require more evidence. The question of 'cure' cannot be settled until a longer time has elapsed and more experience has been acquired. The psychical influence of abdominal operations has been underrated, and so has that of Lourdes by the medical profession. In illustration, as we think of this point, we recall a case of urgent serious vomiting submitted to abdominal section. As nothing to account for this could be found, the abdomen was closed, and, doubtless, adhesions formed. Subsequent examination proved that the patient was suffering from locomotor ataxia. Nevertheless, his sickness disappeared from the time of the operation, and later, when he was submitted for our inspection, he had gained two stones in weight.

The second point is the ingenious suggestion that the available omentum will form a sort of loose mesentery. The most rigid and unyielding adhesions, in our experience, have been omental ones formed under similar circumstances as are suggested here, and until there is post-mortem proof that the authors' theory is true, we feel dubious as to accepting it unconditionally.

For the description of the operations in this work we have nothing but praise. The magnificent success obtained should lead every surgeon to doubt any single detail, however trifling, in his methods and technique which does not accord with that of the authors, and indeed the book must be regarded as the authoritative guide to the surgical treatment of diseases of the stomach.

(*Northumberland and Durham Medical Journal*, 1902, p. 97.)

DISEASES OF THE THYROID GLAND AND THEIR SURGICAL TREATMENT. (BY JAMES BERRY, F.R.C.S.)

In the preface to his book, Mr. Berry says: "I trust that those who read the book will deal gently with it, and remember that it is an honest attempt to set forth as clearly and concisely as possible what is known by myself and others about a difficult and somewhat obscure branch of surgery."

Readers of the book will think this a modest estimate of what is one of the best surgical monographs that has been written. The book throughout bears the impress of thorough, careful work, done by an able, experienced and enthusiastic surgeon, who can form and express clearly the opinions which his exceptional experience and skilful use of it have led him to adopt. The following is a sample of the manner in which each portion of the subject has been treated. After discussing fully the conditions said to give rise to goitre, and going over each claim advanced, the reasons why they should or should not be accepted, the chapter ends thus :—

" Summing up, there can be no doubt that climatic and atmospheric conditions have little or no share in the causation of goitre. That want of air and sunshine has nothing whatever to do with it is equally certain. Habits, such as carrying weights on the head, violent exertion, and the like, play but a secondary part in the production of the disease. That heredity is a cause of goitre is extremely doubtful. Intermarriage has certainly no share in its causation.

" That there exists some definite relation between endemic goitre and some poison in the soil upon which it is found is tolerably clear, and there can be no doubt that in the vast majority of cases drinking water is the vehicle by means of which that poison obtains access to the body. Such water is usually, if not always, derived from calcareous soils, but it is probable that the goitre-producing poison is not a salt of lime or magnesia. It has not yet been proved satisfactorily that any salt of iron is the essential constituent. The same may be said of micro-organisms."

Chapter I, deals with the anatomy of the thyroid gland. The presence of a distinct though delicate capsule investing the gland is emphasized as an important surgical fact. This is of more than usual interest to us, as we can recall that more than a quarter of a century ago the same teaching was the foundation of the pioneer work of Dr. Patrick Heron Watson, who introduced the modern safe operation for removal of the thyroid gland.

The anatomical relations of the recurrent laryngeal nerve and of the gland itself are carefully given ; the vascular supply and position of the blood-vessels are fully described ; the pyramid and its variations especially are dealt with in such a manner that the reader feels satisfied, after a perusal of this chapter, that he has obtained much useful information not easily accessible elsewhere. The parathyroids, which have recently attracted considerable attention, are dismissed in a short sentence describing their position and their lack of vesicles containing colloid, and their function as being thought by some to be different from that of the thyroid gland itself.

In the following chapters the diseases common and rare are fully described and emphasized by illustrative cases and specimens removed from them. At the end of the book the surgical treatment is dealt with in the fullest possible way, every attention being paid to the most minute detail.

We think that for a long time this book will remain the guide to surgeons in the treatment of diseases of the thyroid gland, and we have no hesitation in saying that every one who is interested in this subject ought to possess himself of it.

FRACTURES. (By CARL BECK, M.D.)

This is an attractive-looking book of some 330 pages, beautifully and copiously illustrated from skiagraphic plates, photographs, and woodcuts. It is dedicated " to Wilhelm Conrad Röntgen, without whose discovery much of this book could not have been written." It " is an effort to encompass

in a systematic treatise the important essentials of the publications on this subject "—that is, the application of Röntgen rays in the diagnosis, pathology, and treatment of fractures and dislocations. Many of the skiagraph pictures are very good, but it is noticeable that the best and clearest of them are illustrations of common, well-understood fractures, where *x* rays are not necessary for either diagnosis or treatment. In many of the illustrations of fractures in the region of joints, where fragments of bones are said to be detached, it is impossible to be certain that such is the case, and it is doubtful whether one would be wise in accepting the verdict of such a skiagram; this may, however, be due to error in printing. The interpretation of skiagrams is often both difficult and misleading. Much distortion may be produced by the limb not being in correct relation to the Röntgen tube, and, in the case of two parallel bones, they may appear to be in abnormal relationship when their correct relative positions are not disturbed. The most useful illustrations in the book are photographs (not skiagraphs) of patients with various fractures and dislocations. These are excellent. It is noticeable that where clearness is required woodcuts are used. Hardly any mention is made of the anatomy of fractures, the bones being viewed from a Röntgen standpoint—that is, they are treated as the most important anatomical structures, whereas it is essential to have exact knowledge of the anatomy of the soft parts, if fractures are to be treated successfully. The whole book is on a different plan from that to which we in England are accustomed. We are told that "accuracy takes the place of ignorance and doubt, and painful manipulations cease to be necessary for diagnostic purposes." The style of writing is not easy, and the author makes use of many long, ugly words, such as "diagnosticating" and "immobilization." As an example of style the following may be quoted:—"The after-treatment of fractures must be predicated upon a thorough recognition of the anatomic relations of the line of solution of osseous continuity, while in dislocations the therapy after reduction is very simple;" or again, "It is evident that, if there is no *dis*-placement, no *re*-placement (or, better said, no reposition) will be necessary," and throughout the book this ugly word "reposition" is used instead of "replacement," because it is stated to be more accurate. Indeed, this last-quoted sentence is very characteristic of the whole book—a misdirected straining after accuracy—an attempt to change our ideas without improving them.

Röntgen rays are frequently of great use and sometimes essential to correct diagnosis of fractures, but the usefulness of their discovery is not increased by calling it "epoch-making," or by speaking of it as follows:—"Few scientific discoveries of the century have astonished the world more than that reported by Wilhelm Conrad Röntgen, of Würzburg-on-the-Main. The significance of this great discovery cannot even yet be estimated," or again, when treating the subject of fractures into the elbow or wrist joints by saying, "a large number of new facts have been revealed, which have entirely revolutionized our pathologic and therapeutic views;" or again, "especially in regard to the so-called Pott's fracture, many fresh facts were revealed by the rays, so that just as in fracture of the lower end of the radius, our former views have been changed completely." When dealing with "typical fracture of the lower end of the radius (erroneously called 'Colles' fracture')," the author more than once lays claim to being the first surgeon to show that the end of the ulna was also frequently broken; this in 1897. It is always dangerous to lay claim to new ideas or methods in surgery. It were better to say "this was not formerly known *to me*." The reviewer can recall a discussion, in 1891, when the point of the frequency of fracture

of the ulna in Colles' fracture was debated. The book is, on the whole, disappointing. The author is carried away by his subject, and attaches exaggerated importance to the value of Röntgen rays.* The general principles of the treatment of fractures are neglected. Directions are given as to the way to "put up" various fractures, but nothing is said as to the anatomical causes of the maintenance of the broken bones in faulty positions, and unless splints or any apparatus are applied with correct anatomical knowledge, and a clear view of what is required to keep the broken fragments in position, then the surgery of fractures cannot be good.

(*Northumberland and Durham Medical Journal*, 1902, p. 171.)

HERNIA: ITS ETIOLOGY, SYMPTOMS, AND TREATMENT. (By W. McADAM ECCLES.)

This book has evidently met with approval, for a second edition has been called for eighteen months after the first. We are not surprised at it. Hernia is one of the most common of surgical disorders, and, when neglected, perhaps the most serious and impressive in its termination, so that professional interest is always stimulated by any information concerning it.

We may at once say that a great part of the attractiveness of the book depends upon the excellence of its illustrations. Nothing could be better, especially in the matter of truss application, and this throughout is the strong part of the book. The reader of it is certain to get hints, and valuable ones too, on the instrumental treatment of hernia, for the author has evidently made of this a very serious and enthusiastic study. Every method of application to every variety of hernia of every form of truss is here excellently illustrated, and no medical man in possession of the book, and working on the information contained in it, can fail to do the best for his ruptured patients that can be done by instruments.

The very great importance attached by Mr. Eccles to truss treatment has, as we think, led him to minimize the "radical cure" operation; but of this more later.

In every essential the teaching of the book is based upon sound pathology, but here and there we meet with statements which we cannot pass unchallenged.

On page 59 we read, under pathological effects of strangulation, "The omentum does not exhibit signs of injury to its tissues nearly so rapidly as does the bowel in the sac. It is a question, indeed, whether a pure epiplocele, if its contents becomes strangled, ever shows the signs and symptoms of a true strangulated hernia, much less the pathological alterations which occur when bowel is nipped."

The first statement has so many exceptions, that its value is doubtful. We have seen more than once a portion of gangrenous omentum in a sac with intestine so little damaged as to be returnable to the abdomen. The author later on admits of this possibility, but offers the ingenious explanation that the mortification was due to septic infection from the damaged bowel. There is no evidence offered in favour of this suggestion, and from what we have seen we cannot accept it without further proof. There was no evidence of sepsis in some of our cases, and septic mischief was not caused by the return of the involved bowel into the abdomen.

That acute strangulation of the omentum may cause sudden severe

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* *I now think it is impossible to make this statement.*

pain, with swelling therein, and great tenderness of the sac, accompanied by abdominal pain, rumbling of wind, inability to get rid of it per anum, vomiting, and absolute constipation, we are confident. Are those the signs and symptoms of strangulated hernia, or if not how are they to be distinguished from it? At other parts of the book the author returns to this question, and admits that strangulated hernias have been operated upon which contained omentum alone, and suggests that in these cases a small loop of strangulated bowel has slipped up unperceived during the operative manipulations, and that the symptoms were caused by this and not the omentum. He also says that ligatures are tied round the omentum with impunity, so why should strangulation of it produce such violent effects?

The answer to both questions is derived from physiology. All of the earliest symptoms of strangulation are due to damage of the mesenteric nerves. Omentum as well as intestine is supplied with them. The damage effected must not be active enough to produce destruction. Irritated nerves convey impulses; destroyed nerves cannot.

We have another complaint to make as to the author's treatment of omentum. When met with in the operative treatment of a hernia, he cuts it off. No good reason is given as to why this should be done, and we have a strong feeling against it. In the first place, a search through the records of operations for the radical cure for hernia shows that the greatest number of deaths following the operation have arisen from hæmorrhage due to slipping of the omentum from its ligatures. This is avoidable. In the second place, ligatures add to the difficulty of returning omentum unless it is much indurated. Last, but not least important of all, the omentum is one of the most useful structures in the abdomen. Its usefulness here has not received the recognition it will receive in the future. There is something extraordinary, almost uncanny, in the creeping, irresistible way the omentum has of surrounding or hemming in anything likely to do damage in the abdomen. It does not matter where the enemy may be lying, the omentum is sure to find the hiding-place, whether up under the liver or at the bottom of the pouch of Douglas. On the difficult subject of how to act when damaged or gangrenous bowel is met with during the operation for strangulated hernia, the advice is sound. Only one point we can find on which to disagree. Primary excision and anastomosis are advised when the general condition of the patient is good. This we believe to be a mistake. However good the general condition of the patient may be, and no matter how skilfully the operation be performed, if there is such marked distention of the intestines above the strangulation as to cause abdominal swelling, the patient is unlikely to recover after this complete operation. The only chance lies in relieving the strangulation and draining the intestine at that point. If on the other hand the intestine is not too much distended, and the general condition of the patient is fair, the complete operation is likely to be successful.

Under the heading, "Differential Diagnosis of Complete Reducible Inguinal Hernia," p. 90, it is said: "There are three conditions which cause enlargements of the scrotum, and which tend to become less, or to altogether pass away when pressed or otherwise acted upon, viz.:—

(*a*). Reducible scrotal hernia;
(*b*). Varicocele;
(*c*). Congenital hydrocele."

We always teach that there are five, and add to those given—

(*d*). Chronic iliac abscess, which has found its way down the inguinal canal;
(*e*). Hour-glass hydrocele.

On p. 98 we meet with the following statement: "It is, of course, an unpardonable error to mistake an inflamed hernia or inflammation of the tissues over a hernial sac for an abscess, and to make an incision into the same." This is not strictly true. We can pardon such an error, for we have committed it ourselves. We have opened an inflamed hernial sac, taking it to be an abscess, and have let out pus, and found the pus enveloping a piece of gangrenous omentum.

The author speaks of truss treatment in childhood with an enthusiasm not borne out by our experience. There can be no doubt that the careful adaptation of a truss in infancy will cure the majority of the hernia of childhood, but we think it unsafe to say, p. 102: "A cure can therefore be safely predicted, but the truss should not be discarded until the child has reached the age of at least three years." We have recently operated upon a person for the cure of a hernia which had been treated by one of the highest authorities on trusses in England, who had worn a truss from the age of 6 months to the age of 28 years without bringing about a cure. Whilst a good deal may be said in favour of the wearing of a truss in extreme youth, to condemn a man in good health, active, and with many years of useful life before him to wear an instrument which will never cure him, seems to us not to be justified in the present position of surgery. We feel sure that an examination of the pictures in this book will satisfy patients that the risk they run from operation is worth running for the chance of a radical cure.

We regard the list of cases "for which an operation should be recommended" as too conservative. Our belief is that a short list might be given of conditions which make operation inadvisable, but that, with few exceptions, an attempt should be made to effect a radical cure. This attempt in the case of inguinal hernia is attended by a very small mortality—not more than 0·5 per cent—in the hands of the more experienced operators, and is followed by a radical cure in 95 per cent. Why then submit patients to the discomfort and risks of truss treatment? We suspect that the answer is to be found in the fact that the author has not seen the best results, and we question whether they are obtainable by the operation he describes.

Both the surgeon and the practitioner will obtain from this book many useful hints, and we cordially recommend it.

1903

SPECIMENS ILLUSTRATING DISEASES AND INJURIES OF JOINTS AND BONES.

Mr. Rutherford Morison and Mr. G. G. Turner.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1903, p. 36.)

Comminuted fracture of the lower ends of both leg bones, that of the tibia extending into the ankle-joint.

Comminuted fracture of the upper end of the tibia, extending into the knee-joint.

A simple fracture of the frontal bone, without any depression, from a child of two years.

A scapula, showing a fracture of the spine united by fibrous tissue. The tip of the acromion was also united to the spine by fibrous tissue, but there was nothing to show whether this was an ununited fracture or an ununited epiphysis.

Three specimens of loose semilunar cartilages; two were detached and torn, one was detached only.

Loose bodies from the knee. Two of very large size ($\frac{1}{2}$ in. by $\frac{1}{2}$ in.) were apparently traumatic in origin, having been removed from the joint of a young man. Another specimen had been removed by sawing through the patella, and so exposing the joint.

The right hip-joint, showing marked rheumatoid changes. The lipping was extreme, and had led to complete 'locking' without any real bony ankylosis.

The bones from an elbow-joint, showing typical rheumatoid changes which had followed an injury.

True bony ankylosis of (1) An interphalangeal joint; (2) The carpus; (3) The knee; (4) The tarsal joints—all due to septic arthritis.

Lower end of the femur, showing a sequestrum, the result of an acute epiphysitis.

Sequestrum and part of involucrum from the radius of a boy of ten.

The lower end of the humerus from a discharging stump, showing a small sequestrum with a large amount of new bone.

The lower end of the femur, showing the effects of the growth of a periosteal "sarcoma" which had invaded the knee-joint.

Also two specimens of deciduoma malignum removed by vaginal hysterectomy.

Very extensive carcinoma of the cervix uteri, removed by combined vaginal and abdominal hysterectomy.

A carcinoma of the sigmoid, which had invaded the uterus. The uterus and the sigmoid had been resected.

Three specimens of malignant disease of the rectum.

A simple polypus (myxoma) of the ileum, which had produced an

intussusception. The piece of bowel had been resected. The patient, who was an old man, recovered.

A breast, showing a duct carcinoma, with intracystic growths.

Calculus hydronephrosis, with the calculi *in situ*.

An epithelioma of the frænum linguæ.

A bone bodkin and about 6 in. of thread, removed from the urethra of a man who had introduced it to relieve urinary irritability.

PATHOLOGICAL SPECIMENS.

MR. MORISON, MR. TURNER, AND MR. HESLOP.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1903, p. 172.)

A communication between the trachea and œsophagus caused by the rupture of a gummatous gland into both tubes.

Plate of artificial teeth which were removed from the œsophagus by posterior mediastino-œsophagotomy. Trachea and œsophagus from the same case, showing a communication produced by the ulceration of the impacted plate.

A series of silk ligatures removed from the midst of an inflammatory mass of omentum. They had been used to ligature the latter in a case of radical cure of hernia.

A foreign body—probably the fibula of a rabbit—which was removed from an ischiorectal abscess.

A fish bone removed from an ischiorectal abscess.

A hydrocephalic fœtus which had produced rupture of the uterus in a woman who was attended by a midwife, and who had been allowed to remain in labour for five days.

A lithopædion removed from the abdominal cavity by laparotomy.

A uterus showing two perforations in the fundus which had been made by a uterine sound.

A pyonephrotic kidney with the calculi in situ.

Ruptured gall-bladder. Stones in cystic duct, gall-bladder, and substance of liver.

A large portion of the stomach removed for carcinoma.

A band passing from the great omentum to the stump of the vermiform appendix.

A calculus which had been impacted in the male urethra. A similar stone from the female urethra, and one from Wharton's duct.

Series of specimens illustrating breast carcinoma.

Two specimens of scar epithelioma of the leg.

Tibia, showing the effects of formative periostitis produced by the growth of an epithelioma.

Epithelioma from face.

Epithelioma of penis.

Tongue, showing epithelioma arising on the site of old syphilitic ulceration.

Examples of malignant disease of tongue and floor of mouth.

Two specimens of hydrocele of tunica vaginalis and of cord.

Examples of hernial sacs.

Tumour of spermatic cord.
Gummatous testicle.
Lower end of femur, showing injury to the articular cartilage. The piece chipped off formed a loose body in the joint.
Specimens illustrating popliteal necrosis and necrosis of tibia.
Conical sequestrum from a stump.
Specimens illustrating necrosis of the phalanges.
Horn shed by natural process from the great toe of an old lady of eighty.
A series of specimens illustrating elbow injuries.
Bones from the elbow-joint, showing the effects of a septic arthritis.
A series of specimens illustrating the common diseases of the vermiform appendix.
A series of specimens illustrating fractures of the vault of the skull.
The bones from a recent Pott's fracture.
Bone ends from a case of ununited fracture of the femur.
Bone ends from a case of mal-union of the femur.
Fracture of the spine, with pressure on the cord.
Tuberculous caries of the tarsal bones.

APHORISMS.

(*Northumberland and Durham Medical Journal*, 1903, pp. 227, 333.)

Suspect any genital or digital sore which does not appear till ten days or more subsequent to possible syphilitic infection.

Previous syphilis, champagne dinners, and a bad conscience predispose to Herpes preputialis.

Herpes preputialis usually commences within twenty-four hours of sexual intercourse as an irritation and itching.

It is not safe to say of a soft penile sore that syphilis will not follow it —there may be a double infection.

Look carefully for other evidences of early syphilis in all cases of skin disease where the rash is multiform and the spots are rounded, ham coloured, and not itchy.

A course of iodide and mercury may 'cure' certain obscure and serious diseases accompanied by muddy anæmia when all other treatment has failed.

Iritis unaccompanied by agonizing pain suggests syphilis.

In an adult double vision or hemiplegia, preceded by a period of bad headaches and insomnia, suggest a course of iodide and mercury.

Loss of sexual capacity, followed by loss of bladder control and attended by no other evidences of spinal disease or by glycosuria in an adult male previously healthy, suggests an energetic course of iodide of potash.

In chronic synovitis of adults, especially when symmetrical, examine the fauces, the shins, the knees, and the skin all over for other evidences of syphilis, and if the bone is enlarged above the affected joint give a course of iodide and mercury.

Multiple circular ulcers and copper-coloured cicatrices on the upper third of both legs are conclusive evidence of syphilis, so are a punched-out hole in the middle of the palate, multiple circular scars on the face, V-shaped scars of the soft palate with lost uvula, depressed hard patches in the tongue, radiating cicatrices at the angles of the mouth, and Hutchinson's teeth.

A history of total blindness commencing in one eye at or about puberty, and after a time involving the other, and terminating (though slowly) in recovery, tells of congenital syphilis.

A single circular ulcer on the leg which has not healed with rest and ordinary treatment, or which heals at one part and breaks down at another, will often get well quickly on iodide of potash.

A parotid tumour, accompanied by facial paralysis, is not *always* malignant. It may disappear with iodide of potash.

All doubtful tumours should not be called sarcoma, especially if the pain in them increases at night. Iodide of potash occasionally works a miracle.

Before concluding that an enlarged testicle in a child is malignant, examine its eyes and ears and nose and mouth and throat for signs of congenital syphilis. An interview with the brothers and sisters of the patient may solve the problem.

A tumour of muscle is most likely to be a gumma.

In serious cases the dose of iodide of potash should not be less than 30 gr. three times a day.

In cases of ' rheumatic fever ' which do not yield to salicylates, examine the urethra in the adult male; and the bones of the affected limb, especially in the neighbourhood of the epiphysis, in children.

The introduction of a catheter, or of any instrument, into the bladder is a responsible operation. A dirty operator may cause life-long damage.

In the diagnosis of a urinary case, use instrumental aids as a last resource.

Ask every urinary case four questions, viz., regarding :—

1. Frequency.
2. Pain.
3. Character of stream.
4. Character of urine.

Note with regard to these :—

1. Frequency of micturition ; whether it is greatest during the night or during the day.
2. Pain—where it is and when it is.
3. Character of stream—its size and vigour.
4. Character of urine—odour, admixture of blood, hair, fæces, etc.

The following is a short summary of the symptoms characteristic of certain diseases :—

Cystitis.—Frequency equally great night and day. Pain in hypogastrium before micturition. Stream unaltered. Deposits of mucus in urine.

Stone in the Bladder.— Frequency increased during day, and especially by exercise. Pain at end of penis and at the termination of micturition. Stream occasionally stopped by ball-valve action of stone. Small quantity of blood with last drops of urine after violent exercise or straining.

Prostatic Disease.—Frequency increased at night. Pain at end of penis and at termination of micturition. Stream diminished in force, not necessarily in volume. In cancer and tubercle of the prostate blood comes with last urine.

Stricture.—Frequency always increased (small thick-walled bladder). Slight pain in perineum during micturition. Stream small, but forcible; purulent threads in urine.

Always make a careful examination of the kidneys before concluding that the disease complained of is in the bladder; for all the symptoms of bladder disease may be caused by a pyonephrosis.

The urine (hæmaturia) is frequently a diagnostic puzzle.

Blood in any quantity from the urethra escapes independent of micturition.

A small quantity from the deep urethra will appear with the first urine.

A large quantity from the bladder will be bright red, and in large nummular clots. A small quantity from the bladder escapes with the last drops of urine.

Blood from the kidney makes the whole urine smoky.

Long, worm-like clots have come from the ureter.

Smaller casts suggest an origin from the pelvis of the kidney.

Profuse, painless, relapsing hæmaturia suggests papilloma of the bladder.

Bloody anuria is characteristic of mechanical suppression (stone in a single ureter, or in both.)

Hæmaturia, with enlargement of one kidney, suggests malignant growth.

Hæmaturia, with large tumour of both kidneys, suggests congenital cystic disease.

Hæmaturia, along with a hard pulse and alternating with epistaxis, suggests cirrhosis of the kidney.

A clouded, milky urine suggests pus.

Pus in the first urine suggests urethral disease.

Pus in the last urine suggests prostatic disease.

A thick, heavy layer of sticky, offensive pus in alkaline urine suggests bladder disease.

A milky, purulent diffusion throughout acid urine suggests a kidney lesion.

In women, pus in the urine may be derived from a source other than the urinary tract.

Oil globules, found microscopically, suggest that the specimen was obtained by a catheter; hair, that a dermoid ovarian tumour has opened into the bladder; striated muscle, a fistulous communication with the intestine; fœtal bones, the discharge of an ectopic gestation.

The presence of a vesico-vaginal or vesico-uterine fistula can be proved by the injection of sterilized milk into the bladder, when its escape from the vagina may be noted.

The most common causes of retention of urine are :—

In the child : Impacted urethral calculus; ligature round the penis.
In young men : Gonorrhœa (prostatic abscess).
In middle-aged men : Stricture.
In old men : Prostatic disease.
In young women : Backward displacement of pregnant uterus.
In older women : Uterine fibroids.

Always empty a distended bladder without delay. Opium is no remedy for this.

The stricture which causes retention and visible bladder distention is elastic, and readily yields to a catheter skilfully used.

A tight, old stricture seldom causes visible distention of the bladder. It causes a small bladder with thick walls, which may be felt bimanually like a uterus. And a strong bladder ruptures the urethra, and urine is extravasated.

An indurated ulcer on the glans penis of a man over fifty, of three months' duration or over (if unattended by enlargement of the whole chain of inguinal glands on both sides, and a specific eruption on the trunk), is an epithelioma of the penis.

A stony, hard swelling in one or both corpora cavernosa is due to cavernitis. In nine of ten cases it is syphilitic. It disappears slowly on anti-syphilitic treatment, but leaves a shrunken mass of fibrous tissue which prevents normal erection afterwards.

A hard lump in the perineum of a stricture case is due to abscess from extravasation of urine.

A black spot on the glans penis following rough catheterism, or the passage of a calculus, is due to urinary extravasation and gangrene of the corpus cavernosum. The patient will die.

Painful incontinence in a child suggests bladder-stone.

In a young woman incontinence is not infrequently cured by the proposal of thorough examination.

In an old man it suggests overflow.

In a woman after confinement it suggests vesico-vaginal fistula.

In an older woman it suggests cancer of the cervix and vesico-vaginal fistula.

If 'senile' gangrene commenced in the sole of the foot, or in any part of it except the toe tips, examine the urine for sugar.

Examine the urine for sugar in all cases of pruritus vulvæ.

When in doubt as to the cause of cystitis, remember the possibility of genito-urinary tuberculosis.

There is no such disease as spermatorrhœa.

It is the normal function of the testicles to secrete spermatic fluid; they may do so in excess.

There is no such disease as prostatorrhœa. The prostate normally secretes a glairy fluid, which may escape from the penis during erection or during the passage of a constipated stool.

Gonorrhœal prostatitis may result in chronic disease of the prostate and mucopurulent discharge from the prostatic urethra. This troublesome disease must not be mistaken for the functional disturbances called prostatorrhœa.

Impotence is due either to gross genital defect, to organic nervous disease, to serious illness, or to mental defects.

The organic form of impotence never gives rise to serious complaint; the functional form fills the coffers of quacks and swells the list of suicides.

The evil effects of masturbation are mental and moral; temporary debility in weakly lads may result from it, but no permanent physical disability.

Varicocele commencing in a patient over forty suggests a renal growth.

A NOTE ON THE JUNCTION OF THE FASCIA TRANSVERSALIS WITH THE FASCIA ILIACA.

By G. Grey Turner.

(*Northumberland and Durham Medical Journal*, 1903, p. 229.)

When operating for psoas abscess by an incision in the right iliac fossa, Mr. Morison noticed a strong fascia attached to the iliac crest. He suggested that I should make some observations in the post-mortem room, to determine the relationship of this structure. The ordinary text-books on anatomy are not very explicit on this point. The usual statement is that "external to the femoral vessels the fascia transversalis is connected to the posterior margin of Poupart's ligament, and is there continuous with the iliac fascia."

In a series of subjects I found the condition as follows:—The fascia transversalis joins the fascia iliaca along a line which passes from the outer edge of the femoral sheath upwards and outwards to the inner lip of the iliac crest opposite the prominent tubercle which is present on the external lip about 2 in. behind the anterior superior spine. The junction is marked by a very definite thickening, which shows as a white line along which the deep circumflex iliac artery is conducted in the first part of its course.

Passing from this line to the outer part of the ' back ' of Poupart's ligament, the anterior superior spine of the ilium, and the anterior third of the inner lip of the crest, is a perfectly definite strong fascia with fibres directed downwards and outwards. The fascia was best marked just internal to the anterior superior spine, and at this point was half an inch broad. To open up the iliac fossa behind the fascia iliaca it was necessary to cut through these special fibres.

Dr. Wm. Turnbull, of the College of Medicine, was kind enough to examine a series of subjects with me in the dissecting room. In each instance the above described arrangement was found, being best seen in well-developed bodies.

REVIEW.

(*Northumberland and Durham Medical Journal*, 1903, p. 125.)

INTERNATIONAL TEXT-BOOK OF SURGERY. (EDITED BY DRS. WARREN AND GOULD.)

We have already, in a review of the first volume of this work, expressed the high opinion we have formed of it as a contribution to scientific and practical surgery. In the second volume, dedicated to Regional Surgery, the same high standard of teaching is maintained.

In Chapter I., devoted to congenital deformity of lips and mouth, we note the following sentence :—

" The comparative methods of the obturator and the operation for the relief of cleft palate are still *sub judice*. The operation shuts off effectively the nasal cavity from the mouth, and generally gives satisfaction to those patients who have submitted to it. The voice is, however, often imperfect, owing to tension of the soft palate. It is also often necessary, in cases that have been operated upon, to wear a plate to support the teeth. The obturator is no more inconvenient or uncomfortable than a set of false teeth—it produces excellent results in the improvement of the voice."

This may be some consolation to surgeons who are unable to obtain by operation the results recorded by some operators.

In the treatment of enlarged tuberculous neck glands excision is recommended, and the statement is made that, " The larger my experience in it, the more reason have I to be satisfied with it." But the author's methods seem to us to be somewhat half-hearted. He dreads the seriousness of the operation and the long scars that are left. The incision he finds to be " the most useful is one from the tip of the mastoid process to the cornua of the hyoid bone. When the diseased glands beneath this have been removed, others below, behind, or in front of it can be brought into the wound by drawing aside its cover, pushing up the gland from outside, or by the careful use of the finger or blunt dissector within the wound. By practice and patience the entire chain of glands along the internal jugular vein can be removed through this incision, as well as some, if not all, of the submaxillary glands." We consider this teaching pernicious and misleading, for it is certainly untrue. Either the whole of the diseased glands should be removed —and it is impossible in extensive disease to do this through the incision advocated—or the case should be let alone. A free exposure reduces the risk of the operation to a minimum, and allows of the removal of every

diseased centre, which is the main object of the operation, and the scar can be reduced to small dimensions by careful sutures. We especially regret that such advice should have emanated from an English source, for we feel sure that it will be almost universally condemned in America and on the continent of Europe.

Under the treatment of empyema, it is stated that " most surgeons at the present time resect a portion of the rib," and the practice is commended. The incision recommended is " over the ninth rib, and parallel to its axis." With neither recommendation can we agree. Resection of a rib is unnecessary in the majority of instances, the ninth rib is too low a point to select, and the incision should not be parallel to but across the axis of the rib. By this means the risk of a valvular opening which is mentioned as following the operation, if the arm be held too high during its performance, is certainly avoided, and an opening in this direction accommodates itself more readily to every movement of the trunk.

With the chapter on hernia, written by authorities of world-wide fame, we are disappointed. Except for the portions of it dealing with operative treatment, there is little that is satisfactory. The operations for the radical cure are fully illustrated and described, and the results given of after-histories are so valuable and so impressive as to prove recurrence rare in selected cases, and mostly the result of a faulty technique. One of the authors, for example, in inguinal hernia, had 5 relapses in 549 cases operated upon by Bassini's method, and in femoral hernia 15 cases with 1 relapse. " In the majority of umbilical hernias operation is not to be advised. . . . The results are by no means as good as those obtained in inguinal and femoral hernia. . . . In irreducible cases the mortality may be said to be not far from 5 per cent, increasing or diminishing with the size of the hernia and extent of the adhesions. Of 21 cases traced 12 relapsed."

It was with much interest that we read the article on Appendicitis, by McBurney, whose name has become a household word through the discovery of a point which passes by his name.

The illustrations accompanying this paper are the best we have seen of inflamed appendices, and are worthy of special mention.

In dealing with pathology—though in the main the author's views are our own—we think that sufficient importance has not been attached by him to the mechanical factor as a cause of perforation and gangrene. It is unnecessary to assume, as the author does, for all cases of gangrenous appendicitis an infective organism of extreme virulence. The tension of pent-up contents, not necessarily exceptionally vicious, is the common-sense explanation of such an occurrence ; and, as we know that gangrene can be brought about in that way, why seek to explain it by bacteriological processes, which none of us are very certain about ?

There are a few points in the differential diagnosis and in the treatment about which we differ from the author. He leaves the diagnosis of abscess itself uncertain, for on page 402 the following sentence occurs :—" If, after an acute attack, adhesive peritonitis takes place, the symptoms persist, and there is added the local sign of a tumour in the right fossa, caused by the adherent mass of coils of intestine."

We regard every tender tumour at this stage in connection with the appendix as an abscess, and believe that from the position and relations of the swelling that the appendix may be located before operation, though no attempt at this is suggested by the author.

Again, he says, p. 402, " If not surgically treated, such an abscess may yet rarely undergo spontaneous cure by encapsulation of the abscess with

gradual caseation and absorption of its contents ; or the abscess may rupture and discharge its contents externally or into some viscus ; or the rupture may occur into the free abdominal cavity, with septic peritonitis and death ; or the patient may die of prolonged sepsis and exhaustion." We scarcely doubt that a considerable number of such abscess cases recover spontaneously, and that nine out of ten of these do so by discharging into adjacent coils of intestine. The other terminations mentioned are rare.

Of treatment, he says, p. 407, " No medical treatment of proved value for appendicitis has ever been presented to the profession, and the pathology of this disease renders it extremely unlikely that any such treatment will be discovered. In other words, every case of appendicitis is liable, sooner or later, to demand surgical interference for its cure."

Though saying this, he condemns the dictum that every case of appendicitis should be operated upon as soon as diagnosis is made, and advises—though with great care and a leaning to operation, if symptoms lead to any doubt as to the seriousness of the case—waiting for an interval operation. This he recommends after a first definite attack, however mild. In the treatment of abscess he fears removal of the appendix, if this requires a prolonged or difficult dissection, and leaves it with the hope that the attack has often destroyed or obliterated it. The wound made for the treatment of the abscess, if large and acute, he leaves unsutured and packed with gauze. Such treatment appears to us, to say the least of it, unsatisfactory. We feel that the teaching of such authorities should be to remove the appendix in all but the most exceptional cases ; for we know that recurrence of the disease is not infrequent if this rule be neglected, and we also know that, given sufficient care, the operation can be done with safety. We cannot either think that the precaution of leaving the entire wound packed with gauze and open will commend itself to future generations of surgeons. We have proved that efficient drainage can be satisfactorily secured through a limited opening, and that it is safe and satisfactory to close the whole of the wound except this particular portion.

As in all scientific American works, the illustrations here are more numerous and much better than our own, and the publishers are to be congratulated on their share in the undertaking. Whilst it would be easy to pick out, as we have done, matter to find fault with here and there, the book as a whole is a most valuable addition to surgical literature, and a suitable complementary work of reference for advanced students who have already read the shorter work of Rose and Carless.

1904

THE SURGICAL TREATMENT OF TUBERCULOSIS.

(*British Medical Journal*, June, 1904, p. 1314.)

The Chairman (Mr. Rutherford Morison) showed the following cases illustrating the surgical treatment of tuberculosis.

Tuberculous Knee-Erasion.

A man, age 44. Four years ago the joint was erased for extensive disease, involving the whole of the synovial membrane. There were now no signs of disease. The movements were limited to one-third of the normal. He walked very well.

Tuberculous Knee-Excision.

A girl, age 12. Four and a half years ago the joint was excised for disease involving the bone. There was now a small tuberculous skin focus about the centre of incision. The bones were firmly ankylosed in a slightly flexed position. She was able to walk well; shortening was very slight.

Tuberculous Ankle: Excision of Astragalus.

CASE 1.—A man, age 25. Five years before admission the right ankle-joint became swollen, and painful sinuses appeared, for which he was twice operated upon in different hospitals. During the two months preceding admission he was losing flesh rapidly. He looked thin and ill, and there were the signs of tuberculous disease of the ankle with septic sinuses. Four years ago the astragalus was exeised and all diseased tissues were removed. When shown he was fat and strong. There were no signs of disease, the movements of the new joint were normal, and he could run and walk perfectly well.

CASE 2.—A girl, age 13, four years ago was admitted with advanced tuberculous disease of the ankle with a septic sinus on the outer side. The astragalus was excised and the joint thoroughly erased. After this two further operations were necessary on account of persistent high temperature. When shown, the new joint was quite sound. The foot had assumed the position of talipes varus. Movement was limited, but she could walk fairly well.

Tuberculous Disease of Spine: Psoas Abscess: Radical Operations.

CASE 1.—A girl of 9, for two years before coming to hospital complained of pain in her back. When admitted, four years ago, there was rigidity and slight angular deformity in the lower dorsal spine, together with two large psoas abscesses. Both abscesses were opened by incisions extending from either loin forwards to the middle of Poupart's ligament. The whole cavity was thus exposed, and on the right side the focus in the vertebra was scooped out and swabbed with iodoform. The incisions were sutured in layers

without drainage. Beyond some tuberculous infection of the scar the patient made a complete recovery, and was sent home wearing a poroplastic spinal jacket. At the present time the patient was quite well. Both incisions were sound, and all signs of active disease had disappeared. She still wore a jacket.

Case 2.—A man, age 43. He was admitted to hospital with a large psoas abscess extending below Poupart's ligament. There were the signs of caries of the lumbar spine. Four years ago the same operation was carried out as in the previous case. The incision extended from the right loin behind downwards and forwards to below Poupart's ligament. Several sequestra were found ; a focus in the vertebra was scooped out. At the present time the scar was perfectly sound ; there were no signs of active disease. Patient had worked for some time at a colliery. He had gained 3 stones in weight.

Tuberculous Disease of Palmar Bursa.

Case 1.—A lad, age 19. Was admitted with disease of the bursa extending into the little finger and above the wrist. In the latter situation there were sinuses leading into the sheaths. Three years ago as much of the diseased synovial membrane as possible was dissected away ; the remainder was swabbed with pure carbolic and iodoform, the hand being kept on a splint for seven months. He had now perfect use of the hand, and there was no disease evident ; he was working regularly as a fisherman.

Case 2.—A man, age 24. Six months before admission a swelling appeared in the palm ; four months later an incision was made into it. The palmar bursa, with its extensions to the thumb and little finger, was involved. A similar operation to that described above was carried out. Some time later the extension to the little finger had to be separately dealt with. Now, four years after the operation, he had perfect use of the hand and there were no signs of disease.

Several other similar cases were also shown.

SURGICAL APHORISMS.

(*Northumberland and Durham Medical Journal*, 1904, pp. 122, 196, 373.)

Lip.

A hard crack on the lip of an elderly person, which does not heal after one week of careful treatment, should be excised.

Tongue.

A ' plastered ' tongue indicates fever.

A moist brown tongue suggests loaded bowels.

A dry brown tongue suggests failing circulation.

A moist scarlet red tongue suggests pus.

A dry red tongue suggests failing assimilation

An ulcer on the tongue which does not heal immediately after all visible

causes of irritation have been removed should be regarded with grave suspicion. Nitrate of silver can do it no good. Under cocaine, remove a bit of it for immediate microscopic examination.

In a subject past middle age, cotton-wool in the ear and an ulcer on the tongue, suggest cancer.

Throat.

An 'attack' of hoarseness which does not pass off demands in the middle-aged laryngoscopic examination. It suggests cancer of the larynx.

At least nineteen of twenty strictures of the œsophagus are malignant.

An œsophageal stricture low down produces regurgitation of food, which the patient usually describes as vomiting. If the food returned is acid in reaction, it has come from the stomach.

Stomach.

Do not decide upon 'cancer' as the diagnosis unless there are unmistakable physical signs of it.

A simple chronic ulcer at the pylorus causes severe pain, coffee-ground vomiting, a tumour resembling cancer, and anæmia with debility.

Tuberculous tumours of the pylorus are indistinguishable from cancer except by the microscope.

A large sudden hæmatemesis without other stomach symptoms seldom recurs. After one outburst the bleeding ceases

Hæmatemesis occurring in the course of a chronic ulcer recurs again and again. It requires surgical consideration.

Hæmatemesis unaccompanied by malæna points definitely to stomach as distinguished from duodenal ulcer.

Perforating duodenal ulcer is a disease of dyspeptic males between twenty and forty.

Perforating gastric ulcer is a disease of anæmic females from eighteen to thirty.

An emaciated chronic dyspeptic who vomits a large quantity of foul yeasty matter at night, has a dilated stomach due to simple stricture of the pylorus, and requires operation.

In every abdominal case attended by pain and vomiting, first *examine the hernial sites.*

Abdominal Tumours.

In men, nine of ten abdominal tumours are malignant.

In women, nine of ten abdominal swellings are the pregnant uterus.

In women, before concluding that any abdominal tumour requires operation, exclude the possibility of pregnancy or of distended bladder.

Tubercle is the most common cause of indefinite pelvic and abdominal swellings which do not conform to the ordinary types of tumour.

Stony-hard tender nodules on any tumour suggest cancer.

Ballottement suggests pregnancy or cancerous peritonitis; very rarely it may be caused by an ovarian or uterine tumour surrounded by free fluid.

Liver.

A very large painless tumour in the right hypochondrium suggests hydatid of the liver.

Severe spasmodic gastric pain, followed by jaundice, suggests gall-stones.

A hard round tumour under the right costal margin, preceded by a history of 'spasms,' is likely to be an enlarged gall-bladder with a stone blocking its neck or the cystic duct.

Violent attacks of 'spasms,' followed by jaundice, and with no swelling of the gall-bladder, suggests that a stone has lodged in the common duct.

A gall-stone in the cystic duct causes gall-bladder tumour and no jaundice; in the common duct, jaundice and no gall-bladder tumour.

Jaundice and a gall-bladder tumour suggest malignant disease blocking the common duct.

Jaundice and an enlarged nodular liver suggest secondary cancer of the liver.

The indications for operations in gall-stone cases are:—

Repeated attacks of gall-stone colic.

Distension of the gall-bladder.

Persistent jaundice.

The ascites of liver cirrhosis is often preceded by marked tympanitic distension of the abdomen.

Intestines.

Inability to pass flatus and severe rumbling pains in the abdomen are reliable symptoms of intestinal obstruction.

The most reliable sign is visible or palpable increase of peristalsis.

In adults the most common cause of acute intestinal obstruction is tubercle (adhesions), of chronic obstruction is cancer (stricture).

Acute obstruction is usually due to a lesion of the small intestine; chronic, to lesion of the large one.

Not less than 90 per cent of the most acute cases of intestinal obstruction die if treated by opium. Immediate operation is the only satisfactory treatment. Delay of a few hours may mean death.

In the less acute cases, if a single good dose of opium fails to give relief—operate.

After a single dose of opium which has relieved, give one ounce of castor oil and an enema. If these cause a return of the symptoms—operate.

Rumbling pains of some duration and increasing difficulty with the bowels, in a stout patient over 45, suggest malignant stricture of the sigmoid.

A hard nodular tumour in the course of the colon, associated with rumbling pains, alternating constipation and diarrhœa, difficulty in voiding flatus, and occasional blood in the stools, is a malignant tumour of the colon. Both require early operation.

Chronic obstruction of either small or large intestine causes hypertrophy of the gut.

Forcible contraction of the hypertrophied coils of small intestine causes a ladder-like pattern; of the large intestine, prominence of and succussion in the cæcum.

Examine the rectum in every case of 'diarrhœa' in persons past middle age. 'Diarrhœa' and 'sciatica' are symptoms of cancer of the rectum.

A growth in the rectum resembling a hard and nodular uterine cervix is a cancer of the rectum.

Uncomplicated 'piles' are painless. Examine the rectum if pain is a symptom.

In hæmorrhoid cases, examine the abdomen for tumour, the liver for cirrhosis, the heart for valvular disease, and the rectum for cancer.

A 'sentinel' pile marks the outer end of a fissure; a small polypus, its inner limit.

A fistula may sometimes be felt though not seen. From the rectum it appears as an induration in the ischio-rectal fossa. Its inner opening is never more than three-quarters of an inch above the anus.

Peritonitis.

Tenderness and rigidity of the abdominal wall are the most reliable signs of peritonitis.

Appendicitis is the most common cause of acute peritonitis.

The other causes are gross lesions, producing acute sepsis.

The treatment of all is removal of the cause before sepsis has diffused widely over the peritoneum.

Operation can, by removing the cause early enough, prevent dangerous peritonitis in the majority of instances.

Operation is usually too late if deferred till the diagnosis of general peritonitis is assured.

Cancer and tubercle are the common causes of chronic peritonitis.

Tuberculous and malignant peritonitis often present the same physical signs.

Victims to tubercle are often pallid; to cancer, often florid

Appendicitis.

When acute, commences with sudden abdominal pain, attended by sickness, rise of temperature, and rigidity and tenderness in the right iliac fossa.

If the pain is severe enough to entirely prevent sleep for a night, if vomiting is repeated, or if the pulse is over 100—operate.

If a tender definite iliac swelling is found after the third day of the attack, there is an appendicular abscess—operate.

If a tender spot or a tender nodule, or pains on exertion, or uneasiness, or constipation and dyspepsia are left after recovery from an attack—operate.

After two definite attacks, however mild—operate.

The Spleen.

A very large spleen, with no evidence of illness, suggests a fatal blood disease.

Miscellaneous.

Think of alcohol in cases of morning sickness, morning diarrhœa, morning cough, and restlessness to the extent of inability to lie in bed till a reasonable hour in the morning.

The first signs of *waxy disease* are diarrhœa, albumin in the urine, and epistaxis.

Diseases of Women.

Never neglect the history of a missed menstrual period.

A healthy woman, previously regular, whose period has been missed for a week, is probably pregnant. If she is attacked by sudden severe abdominal pain, followed by fainting or collapse, suspect ruptured ectopic gestation.

Amenorrhœa, with increasing monthly attacks of pain, suggests mechanical obstruction to the escape of menstrual products.

Uterine hæmorrhage in a woman beyond the menopause suggests cancer of the uterus, and demands immediate investigation.

A sloughing polypus of the uterus will cause fœtid discharge, profuse hæmorrhage, and the 'cancerous cachexia.'

Think of alcohol as a possible explanation of uterine hæmorrhage when no satisfactory local cause is discoverable.

Uncomplicated simple ovarian and uterine tumours are unattended by pain. Pain suggests complications or malignancy.

If a tumour has been recognized and sudden abdominal pain develops, followed by vomiting, tenderness and swelling of the tumour, perhaps some uterine hæmorrhage, and peritonitis commences, an ovarian cyst has twisted its pedicle.

Beware of surgical interference with the young woman who has been ministered to by charitable ladies and the clergy, whose 'agonizing suffer-

ing' has been so patiently borne that she deserves the crown of martyrdom, and who tolerates rectal and vaginal examination without a groan.

In all Cases.

Beware of the diagnosis of hysteria, neurosis, or neuralgia, unless organic disease can be excluded with certainty.

Remember that exploratory incisions should not be made a cloak for diagnostic incompetence.

Inflammation.

Knowledge of the causes and progress of inflammation is essential to satisfactory surgical treatment.

The changes concerned in the aseptic repair of injuries may be regarded as physiological inflammation.

Acute pathological inflammation, considered from the practical surgical point of view, results only from infection by micro-organisms.

Inflammatory Phenomena.

The first minute change observable in the damaged tissue is occasionally a transient contraction of the smaller blood-vessels.

The next is invariably dilatation of the blood-vessels and increased vigour of the circulation in them.

Then follow gradual slowing of the circulation; oscillation of the blood in the vessels; and,

Finally, stasis.

When retardation of the local circulation is proceeding, examine the contents of the blood-vessel.

They will be seen to divide into a central red, more rapid, and a peripheral slower light current.

The central consists chiefly of red corpuscles.

The peripheral consists chiefly of liquor sanguinis and leucocytes.

When stasis is complete, the red corpuscles adhere and form a bright central red axis.

The leucocytes tend to attach themselves to the vessel walls.

'Diapedesis' follows adhesion of the leucocytes; by means of amœboid movements the leucocytes crawl through the vessel walls and escape.

In a short time the connective tissue surrounding the smaller blood-vessels is crowded with leucocytes.

These are joined for purposes of defence by 'free cells,' always present in greater or less numbers in the connective tissue spaces. Both are described as 'microphages.'

A large third cell derived from the connective tissue elements, a ' macrophage,' adds to the strength of this wonderful army.

Micro-organisms, dead cells, and destructible dirt are devoured by these voracious soldiers. This is ' phagocytosis.'

The general control of the army finds its analogy in the chemiotaxis of the body.

The invading organisms produce toxins, which may be compared to lyddite. Both paralyze and demoralize the army of defence.

In less serious battles the invading micro-organisms are destroyed or imprisoned by the cells.

In the thickest of a severe fight heaps of dead soldiers form pus.

Causes of Inflammation.

The causes of inflammation are predisposing and exciting.

Predisposing causes are :—

1. Local.
2. General.

Of local causes, defective circulation is the chief.

Varicose veins and arterial disease are the most important. Both diminish tissue resistance.

Nerve lesions less commonly have the same effect.

A previous attack of inflammation in the same part diminishes its vitality and predisposes to further attacks.

Traumatism is also a predisposing factor.

General predisposing causes are such as lower the bodily resistance. Malnutrition, old age, heart and kidney disease, diabetes, and alcoholism are the chief.

The known exciting causes of inflammation are :—

1. Traumatic, mechanical, chemical, electrical, thermal (heat and cold), *x* rays, etc.
2. Microbic infection.

There are two distinct forms of inflammation :—

1. Acute.
2. Chronic.

Acute Inflammation.

The only known cause of acute inflammation is microbic infection by a pyogenic organism.

Staphylococcus pyogenes aureus is the most common cause of acute inflammation.

Expect it in boils, carbuncles, abscesses, septic osteitis, and other localized suppurations.

In spreading inflammation, of which erysipelas is the type, streptococci are the usual cause.

A spreading inflammation, accompanied by abscess formation, frequently results from a mixed staphylococcus and streptococcus infection.

Chronic Inflammation.

The two known causes of chronic inflammation are tubercle and syphilis.

An inflammation, the cause of which is unknown, can be ascribed to traumatism, rheumatism, or gout.

Termination of Inflammation.

The possible terminations of inflammation are to be remembered.

In all essentials they are the same in each structure. They are :—

1. Resolution.
2. Thickening ; fibrosis in the soft parts—sclerosis in the bones.
3. Partial destruction ; ulceration, caries, sloughing, pus formation.
4. Total destruction ; gangrene, necrosis.

Signs of Inflammation.

The local clinical signs of inflammation are redness, swelling, heat, pain, and loss of function.

Redness is the result of hyperæmia.

Swelling is due to escape of fluid constituents of the blood-vessels into the connective tissue.

N.B.—Though the swelling usually coincides with the inflamed area, this is not invariable. An inflamed scalp produces œdema of the eyelids ; an inflamed palm, swelling on the dorsum of the hand ; of the lower abdominal wall, œdema of the scrotum, etc.

This swelling follows the path of least resistance. These transferred swellings may be of considerable diagnostic importance.

On the chest or abdominal wall, or on the scalp, or surrounding a long bone, they suggest deep-seated suppuration.

Heat results from increased blood supply.

N.B.—It is an invaluable clinical sign, for it denotes active and progressive change. If a swollen joint is hot, it requires rest ; if cold, there is no such need for care.

Pain results chiefly from increased tension. It is increased by dependency, relieved by elevation of the inflamed part.

N.B.—The most tender spot indicates the position of greatest mischief. Pressure with the point of a probe will demonstrate the best point for an incision in palmar abscess. Point pressure with the finger may suggest that

inflammation of the gall-bladder or of the appendix is the cause of an obscure abdominal illness.

The character of the pain may give a hint as to the structures involved.

A boring, aching pain, worse at nights, suggests bone inflammation.

Mucous membranes smart.

Serous membranes stab.

A sickening pain suggests testicle, kidney, mamma, or ovary.

A throbbing pain suggests suppuration.

Pain may be referred and misleading. The following are examples :—
Kidney pain may be felt in the testicle.
Spinal pain in the abdomen.
Hip pain in the knee.
Rectal pain in the heel.
Prostatic pain in the penis.
Eye pain in the head.
Intestinal pain in the umbilicus.

Impairment of Function.—A young child never shams. If it walks lame, or the movements of any of its joints are impaired, suspect inflammation.

Diffusion of Inflammation.*

Red linear streaks, leading from an inflamed part to the next set of glands, mean lymphangitis.

Enlarged tender glands suggest an attempt on the part of the invader to reach the blood-stream.

General Signs.—Inflammatory fever is associated with a quick pulse, increased tissue metabolism, shown by excess in excretion of urea and urates, and with general impairment of all the organic functions—digestion, secretion, excretion—and of nervous, mental, and muscular adequacy.

Treatment of Inflammation.

In the ordinary conditions of life, battles between invading micro-organisms and defensive cells are being constantly waged.

Fortunately for most of us the advantage lies with the defensive cells.

Parts of the body specially liable to invasion, *e.g.*, mouth, tonsils, lymphatic glands, are specially guarded by extraordinary numbers of free cells.

A large quantity or specially virulent quality of micro-organisms is essential to produce disease in a healthy person.

In less healthy ones, or in damaged tissues, serious results may follow slight infections.

The most serious results of all follow infection of the blood-stream.

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* *Inflammation spreads by :* 1, *Continuity;* 2, *Contiguity ;* 3, *Lymphatics ;* 4, *Blood.*

Local Treatment.—The most important item in the treatment of inflammation is its prevention—by avoidance of or destruction of its cause.

This embraces a knowledge of antiseptic surgery, by which wound treatment has been revolutionized.

The object of this is to prevent the intrusion of micro-organisms before a surgical wound is inflicted, and to destroy any that may already have found an entrance to wounds.

The patient must have a surgically clean skin.

The surgeons', assistants', and nurses' hands must be surgically clean.

Instruments, sponges, dressings, ligatures, sutures, etc., must be sterile.

Tissue damage must be avoided by gentle handling. Bruising, tearing, pulling, and rubbing diminish tissue vitality and favour organismal infection ; so do strong antiseptics.

Wounds must be kept dry either by drainage or by elastic compression. Organisms grow in pent-up fluids.

For dirty wounds generous washing with normal saline, the removal of parts damaged beyond redemption, and free drainage are essential.

Remove the causes of inflammation when possible.

If you doubt the overwhelming importance of this rule, watch the disappearance of a traumatic conjunctivitis when its causative foreign body has been removed.

Incise pus collections freely, and drain them thoroughly. The defensive cells will do the rest, if protected by skilful care from further attack.

Rest and steady elastic compression are the chief symptomatic remedies for inflammation.

General rest is secured by confinement to bed ; local by the application of splints and bandages.

Elastic compression is best accomplished by careful firm bandaging over abundant cotton-wool.

Cold, heat, local blood-letting, belladonna, are of secondary importance. Their chief effect is mental.

General Treatment.—In acute inflammation the general principles involved are to help the patient to eliminate the circulating toxins. Rest in fresh air, hot baths, saline purgatives, abundant simple drinks and milk diet, are the chief aids.

For certain specific inflammations the injection of a special antitoxin has been attended by success, and in this direction lies still further promise for the future.

Chronic Inflammation.—The ideal treatment for a localized tuberculous lesion is complete excision.

This should always be done when the operation can be accomplished without inflicting serious damage.

If this is not possible, thorough exposure of the tuberculous focus, removal of as much of the tuberculous products as possible, and this followed by cleansing and disinfection, is the best course.

If the diseased tissues can be completely excised, or nearly so, the resulting wound, however large, should be closed without drainage.

If the diseased tissues cannot be removed (with few exceptions), the wound should be left wholly open, and packed from the bottom with iodoform gauze.

This serves three purposes.

1. It allows of repeated applications to visible tuberculous surfaces (pure carbolic acid is the best).
2. It ensures free drainage.
3. Iodoform stimulates the defensive cells.*

The great majority of tuberculous joints recover if kept entirely at rest from one to two years.

Even neglected tuberculous joints with sinuses, the result of secondary infection by pyogenic organisms, are likely to recover if treated by rest and careful dressing.

The general treatment of chronic tuberculous inflammation consists in improvement of the resisting power of the patient.

The details are :—

Fresh air night and day.

Two pints of milk and two eggs daily in addition to ordinary food.

A general soft soap inunction every night, lathered off in a hot bath, the drying to be done with a rough towel.

The local and general treatment of chronic syphilitic inflammation is by anti-syphilitic remedies.

The most generally useful consists of a mixture of potassium iodide grs. xv., and hydrarg. perchlor. $\frac{1}{16}$th of a gr., dissolved in a wineglassful of water and taken three times a day.

Bone Aphorisms.

1. Spontaneous acute septic osteitis is a disease occurring in young bones only. After the epiphyses have united, spontaneous septic osteitis rarely, if ever, occurs.

2. Children possess an immunity to sepsis, except in their bones, which adults very exceptionally do.

3. In children pyæmia, except from acute bone disease, seldom, if ever, occurs.

4. ' Cellulitis ' occurring in children is never primary in the cellular tissues, but secondary to an underlying bone infection.

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* *I still adhere to this view.*

5. Removal of the primary focus is the most important item in the treatment of pyæmia, for it prevents the development of further metastatic deposits.

Joint Disease.

Diagnosis.—Make a rule to compare a diseased joint with that of the other side.

Note the shape of the joint, whether it is swollen or deformed ; see how the patient moves it, and the condition of the muscles which act upon it.

Feel if it is hot, try the consistency of any swelling in connection with it, and palpate the bones entering into its formation. Test its movements with all gentleness.

Obtain a history of the illness.

Causes of Joint Disease.—All joint diseases result from inflammation ; consequently it is necessary to decide whether septic infection, tubercle, syphilis, traumatism, rheumatism, or gout are the cause.

Joint Tubercle.—The most common joint diseases are tuberculous in origin.

Tuberculous joint disease commences in the synovial membrane or in the bone, never in the ligaments or in the cartilages.

If the synovial membrane is primarily involved, lameness, swelling of the joint, and limitation of its movements are the first evidences. Pain is only felt when the joint is used.

If the bone is first affected, pain when at rest in bed is the earliest symptom. Lameness at this stage may pass off with exercise ; swelling occurs later.

Limitation of the movements of the joint and wasting of the muscles which act upon it are the earliest evidences of joint tubercle.

Starting pains in the limb as the patient is dropping off to sleep are certain evidence of progressive inflammation in the joint ; so are increased heat and active swelling.

The joints most frequently involved are the knee and the hip.

Knee disease usually commences in the synovial membrane ; hip disease in the upper femoral epiphysis.*

Swelling of the knee-joint obliterates the outline of the patella ; of the hip, produces fulness in the groin and displaces the femoral vessels forward.

Pain in the knee may be one of the earliest complaints in hip-joint disease.

Both result if untreated in marked flexion and luxation of the joints.

Diagnosis of Knee Tubercle.—Tuberculous disease of the knee may be confounded with other forms of synovitis.

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* *Usually the diaphysis close to the epiphysial cartilage.*

Tuberculous synovitis is common in children ; any other form is rare.

In adults chronicity, with thickening of the synovial membrane, is in favour of tubercle ; so are progressive inability to use the joint, and recurrence of pain and swelling after periods of improvement. Syphilis of the synovial membrane resembles tubercle. It seldom occurs before thirty years of age ; tubercle more rarely after.

Syphilis produces a nodular thickening (gumma) of the synovial membrane ; tubercle a general doughy swelling.

Syphilis is to be excluded by failure to find other probable evidence of it.

Hæmophilics may develop swellings of the knee and other joints closely resembling tubercle. In every joint swelling enquire whether the patient is a bleeder.

Sarcoma of the synovial membrane or of the lower end of the femur or tibia, and growing into the joint, closely resembles tubercle. Excessive pain suggests sarcoma ; so does very rapid progress of the disease.

Synovitis in both knees of young adults may be mistaken for tubercle.

Tuberculous joints are never or seldom symmetrical.

Rheumatoid arthritis in older persons may be mistaken for tubercle. The reverse is more often the case. Suspect any ' rheumatoid arthritis ' with doughy thickening of the synovial membrane.

Suspect every old stiffened knee, which has had periods of recovery and periods for the return of pain and inflammation, of tubercle. ' Rheumatism ' is usually a wrong diagnosis.

Treatment.—The treatment is rest, complete rest of the joint.

With this must be combined attention to the bodily health. Fresh air night and day—milk and eggs—soft soap inunctions and hot baths.

A Thomas's splint, a Sayre's splint, anyone else's splint, will do no good unless it properly fixes the knee.

Complete fixation of the joint must be maintained for a year.

Indications for Operation.—Only one operation is useful—excision.

If after three months of treatment there is no improvement, excise.

If the joint is stiff and has recurrent attacks, excise.

In patients over 25, excise.

When sepsis complicates the case, excise.

With marked flexion, deformity or stiffness, and luxation with flexion, excise.

When there is ankylosis and deformity, excise.

Tuberculous Disease of Hip-joint.—The first evidence of this is a limp in walking. This may at first pass off after a few days of rest, and recur with exercise. Flexion of the hip is the next noticeable sign.

If the thigh is flexed, the spine comes down flat on the couch; but if the thigh is extended, the spine is arched up till a hand can be put between it and the couch.

Note whether there is tilting forward of the lumbar spine when the thigh is pressed flat down on a couch. This is the best test for flexion of the hip, the amount of which can be measured by gradually raising the leg and thigh till the lumbar spine rests heavily on a hand placed flat on the couch underlying it.

Later, limitation of all the movements of the joint will be discovered.

If, with the thigh flexed to a right angle, the movements of rotation of the femoral head in the acetabulum are found to be free, there is not disease of the hip-joint.

Thickening of the trochanter, especially in patients beyond childhood, is not uncommonly found. The prognosis in such cases is worse than usual.

Palpable swelling may not be found, yet the hip may be diseased.

The conditions with which hip-joint disease may be confounded are :—

(*a*). Disease of the lumbar or sacral spine in which pain is referred to the hip, and flexion of the hip and lameness may be present from iliac or psoas abscess.
(*b*). Congenital dislocation of the hip.
(*c*). Coxa vara.
(*d*). Infantile paralysis.
(*e*). Sarcoma of the upper end of the femur.

When an abscess has formed, it may be entirely pelvic, and only discoverable by rectal examination.

Treatment.—Rest, complete rest, of the diseased joint is *the* treatment of hip disease.

Combined with this, general treatment by fresh air night and day. Milk and eggs and soft soap baths are essential.

Where there is deformity and active disease, fixation of the body in bed and continuous extension of the hip by weight and pulley is the best method of securing rest.

Extension never fails to prevent muscular spasms, and to give relief if skilfully used.

It is often improperly applied.

The weight *must* act in the line of deformity, otherwise pain and spasm are likely to be increased.

Reduce the deformity gradually and painlessly.

So soon as this has been accomplished rest may be maintained by a splint—Thomas's is the best.

Joint rest must be maintained for at least one year.

Rheumatism.—In 'rheumatic' fever which does not respond at once to salicylates, search for the gonococcus.

In ' rheumatic ' fever, complicated by iritis, search for the gonococcus.

In acute ' rheumatism ' of a single joint, search for the gonococcus.

In suppurating ' rheumatic ' joint, search for the gonococcus.

When ' rheumatism ' commences in the plantar fascia, and extends to other joints, search for the gonococcus.

PORTION OF HAY-FORK EMBEDDED IN THE FACE FOR TWO AND A HALF YEARS—REMOVAL.

By James W. Heslop, M.B., M.R.C.S.

(*Northumberland and Durham Medical Society : reported in Journal*, 1904, p. 357.)

The subject shown in the photograph, a boy, age 12 years, was sent to the Royal Infirmary for the removal of what was supposed to be a portion of necrosed bone from his cheek.

The history of the case was as follows :—

Two and a half years ago the boy was riding on the top of a wagon of hay, carrying a pitchfork in his hand. He was unlucky enough to fall off, and sustained a large scalp wound, which stretched from his right temple at the level of the frontal eminence in a vertical direction downwards to the lower and posterior border of his malar bone. The broken pitchfork was found, but apparently no interest was manifested in, or search instituted for, the missing fragment. The boy was rendered temporarily unconscious, and was conveyed home, where the wound was cleansed and united by sutures. The wound healed by first intention, and the patient experienced no ill effects, eating, drinking, and leading a normal life *for two years*, when the wound became slightly painful, and a small abscess formed over the zygomatic process of the malar bone. This was poulticed, discharged a little pus, and readily healed. *For six months* nothing else was noticed, and then something black began to make its way quietly through the skin overlying the malar bone, accompanied by slight pain, but absolutely no constitutional disturbance.

When I saw him, for Mr. Morison, in the waiting room at the Infirmary, he appeared perfectly well and healthy, although a rather stolid and stupid type of boy. Protruding through the skin over the zygomatic process of the malar bone for about one-eighth of an inch, in the situation shown in the photograph, was the blackened end of a foreign body. The skin in the vicinity was absolutely normal in appearance, and closely surrounded the partially extruded substance. On palpation of his cheek there was no tenderness, and his mouth could be opened and shut freely.

The patient was then seen by a large number of students, and afterwards, on taking hold of the exposed portion with my finger and thumb, I was able without any difficulty to remove the specimen shown. This was the broken-off fragment of a pitchfork nearly five inches long, and its withdrawal was accompanied by very slight discharge of serum and blood, without any trace of pus. On examining the specimen it was seen

to be clean, black, and smooth, with the exception of a portion nearer the pointed than the thicker broken extremity. This part, about an inch in extent, was eroded, roughened, and covered with yellow mucо-pus, and had evidently been lying across the back of the naso-pharynx. The boy suffered no ill effects from the removal, and walked out of the Infirmary immediately afterwards to the photographers.

This case is worthy of record on account of the large size of the foreign body and of the extraordinary fact that it could remain embedded for so long a period without giving rise to symptoms. It was, moreover, at the

Fig. 3.

time of removal, evidently being extruded naturally and without suppuration. It had probably transfixed the malar bone, traversed the antrum of Highmore, and crossed the back of the naso-pharynx to the opposite side of the face, as its direction was downwards, backwards, and to the left

Chiefly dramatic as its interest was at the time, this case peculiarly emphasizes a great fundamental principle in surgery, viz., that every scalp wound, however insignificant, should be carefully and systematically probed.

The photographs were taken by Mr. Lee, of Eldon Square, the photographer to the Hospital.

REVIEW.

(*Northumberland and Durham Medical Journal*, 1904, p. 333.)

MANUAL OF SURGERY. (BY ALEXIS THOMSON and ALEXANDER MILES.)

In two handy volumes, Alexis Thomson and Alexander Miles have given an excellent account of surgery as it is taught at the present day. The latest knowledge has been incorporated in their work, and the whole, though presented in the most concise form, is made eminently readable. Edinburgh names figure largely amongst the authorities quoted, and doubtless the book will receive its best welcome from Edinburgh men, but it will surprise us if appreciation is not extended to it outside of this circle.

The handiness of the two small volumes, the fact that in these are to be found an excellent and complete summary of surgery, and the large number of practical illustrations—there are 262 in the first volume—make this text-book one which may confidently be recommended to students and practitioners who wish to keep themselves informed as to recent surgical progress.

As a specimen of the level-headed, concise character of the writing, we may direct attention to the chapter on "Stomach Surgery." In a few pages the gist of all recent work worthy of notice has been incorporated. The suggestions as to when to take surgical action are a proper mixture of that caution and boldness which constitute the best surgical judgment, and the advice offered cannot fail to be useful to those practitioners who consult it.

On page 78 we find the following statement :—"The phagedænic condition is the result of an ulcer being infected with specially virulent bacteria." We do not know that it is, but we do know that 'phagedæna' of the genitals following impure connection is so frequently the precursor of active constitutional syphilis, that if these terms are to be retained a knowledge of this relationship may be of considerable practical value.

On pages 80 and 81 we notice an important omission in detail in the prevention of bed sores (page 80). The avoidance of point pressure by pads, air-cushions, etc., is suggested, so is drying of the skin ; and it is also mentioned that the skin should be hardened by the daily application of methylated spirits. If the directions given with the methylated spirits are that it is to be well, though gently and for some time, rubbed in twice or thrice daily, good may be expected from the application ; but we suspect that the stimulation of the circulation by rubbing plays the important part in this treatment.

On page 81 we are told that tuberculous and syphilitic patients must receive appropriate medicinal and dietetic treatment for their general conditions. In the next edition hygienic treatment ought to be also named, for its importance is certainly no less.

On page 89 we read concerning gangrene : "Speaking generally, it may be said that dry gangrene is essentially due to a simple *interference with the blood supply* of a part ; while an essential factor in the production of moist gangrene is *bacterial infection*."

If we ask a student how he would proceed to produce gangrene in a limb experimentally, we do not expect him to say by the injection into it of some gangrene producing bacillus, though doubtless this can be done with special cultures. The answer we anticipate is that, in order to produce

dry gangrene, he would proceed to empty the limb as far as possible of blood, and then to apply a tourniquet tightly enough to cause entire arrest of the circulation ; that, if moist gangrene was desired, the method by which it could with certainty be obtained would be to apply to the limb full of blood a tourniquet tight enough to arrest first the venous and later the arterial circulation in it. We might also expect from him the information that if all organisms could be excluded from such a limb, the originally moist would finally become a dry form of gangrene, so that though organisms were not required to produce a moist gangrene, they were essential to its continuance, which is quite a different matter.*

On page 97, as a precursor to senile gangrene, it is stated that the patient " has complained of extraordinarily cold feet, etc., for a long time before the onset of definite signs of gangrene." This has not been our experience. We can recall a number of cases in which the chief complaint was a *burning* sensation in the foot, so that the patient for months slept with it lying outside of the bedclothes.

For Vol. II. we have nothing but praise.

We have, however, picked out what we consider some of the defects of Vol. I. Micro-organisms and their works are made to occupy an all-important position. Surely almost sufficient discredit attaches to them already. Is there not a danger of going too far ? We recognize, however, in saying it that we are tilting against surgical present-day tendencies.

For example, on page 36 we find the following sentence :—" The true significance of inflammation in surgical pathology will only be appreciated when bacterial action is accepted as its only cause." So long as inflammation is described as an entity having as its signs heat, swelling, redness, pain, and loss of function, so long will it be impossible to do without a name so convenient in describing this series and sequence of changes recognized by generations of surgeons as inflammation.

" To admit that inflammation is essential to repair is to relinquish the antiseptic idea " (page 37). We do not think so. By recognizing a physiological as distinct from a pathological inflammation, we consider that these difficulties may be more satisfactorily met. How far this distinction can be maintained is a question which is still *sub judice*, and until our present knowledge on the subject is rendered more definite, old landmarks of terminology cannot be spared.

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* *This explanation is still too often evaded.*

1905

THREE CASES OF INTERSCAPULO-THORACIC AMPUTATION.

Under the Care of Mr. Rutherford Morison.

(Reported by Fred Stoker, M.B., B.S. (Durham), late House-Surgeon, Royal Infirmary, Newcastle-on-Tyne.)

(*The British Medical Journal*, November 25, 1905.)

During my term of office as House-surgeon in the Royal Infirmary, I have had the opportunity of observing the two following interesting cases, which, through the kindness of Mr. Rutherford Morison, I am enabled to report. The third case is from the Registrar's notes, and is inserted for the sake of completeness.

Case 1.—M. M., a girl, age 18, was admitted to the hospital with a large painful swelling in the position of the upper part of the humerus.

History.—About three months prior to admission she complained of a severe pain in the shoulder, which radiated down to the wrist. The pain was worse at night, preventing her from sleeping. Three weeks before she came to the hospital the shoulder swelled, the pain became worse than ever, and on movement of the shoulder it was unbearable. These symptoms had since been progressive, the movements of the joint had become more and more restricted. There was no pain in any other part of the body. She did not remember having received any injury to the arm. Of late the patient had lost flesh. There was no family history of malignant disease, or indeed of any serious malady.

State on Admission.—The patient was a pale thin girl with an anxious expression of countenance. She had no abnormal temperature; the viscera appeared to be healthy. Locally, a rounded swelling the size of a new-born baby's head occupied the upper part of the right arm and encroached on the shoulder joint. The skin over it was reddened, and large veins ran over the swelling. Opposite the insertion of the deltoid the swelling was continuous with the humerus, which was normal below this point. The patient could not move the humeral head in the glenoid cavity, the movements at the elbow were quite free. On palpation the tumour was smooth and firm, surrounded the upper end of the humerus uniformly, and extended into and filled up the axilla. There was a painful spot on its anterior surface. No enlarged glands could be felt.

Diagnosis.—Periosteal sarcoma of the upper end of the humerus. A radiograph was of assistance in making the diagnosis, as the tumour gave a perfectly distinct shadow.

Operation.—On February 16 operation was undertaken. Every precaution was used to avoid shock; ethyl chloride was used to commence anæsthesia, and ether to continue it; $\frac{1}{20}$ gr. of strychnine hydrochlorate was administered hypodermically. The arm was first emptied of blood, and

then firmly bandaged with elastic. At first the arm was applied to the side, and an incision made along the clavicle from its sternal to its acromial end. The bone was exposed, the subclavius muscle separated from beneath it, and the clavicle was divided with a Gigli's saw at the junction of its inner and middle third. The distal portion of the clavicle was elevated, and half an inch sawn from it with an ordinary saw ; the periosteum was removed with the bone. The third part of the subclavian artery was now isolated, tied, and divided between ligatures, the vein immediately afterwards being submitted to the same treatment. The nerves forming the brachial plexus having been injected with cocaine (Crile), the incision was next continued from near its acromial termination downwards in front of the anterior axillary line to the inferior margin of the pectoralis major, and the skin was reflected off the chest wall. The pectoral muscles were now cut through, the arm being held at right angles to the trunk. The next step was the completion of the incision, which was carried out by extending it from near the acromial end of the clavicle, round the back of the shoulder and downwards to meet the anterior cut beneath the axilla. The skin was dissected off the back of the scapular region, and the trapezius, latissimus dorsi, interscapulo-vertebral muscles, omo-hyoid and serratus magnus divided. The arm was held away from the body, and the nerves and remaining connections with it were divided. After the tying of the subclavian artery the hæmorrhage was necessarily limited, but any which did occur was immediately controlled by forceps and ligature. The wound was sutured with a continuous catgut blanket stitch with a few guardian silkworm gut sutures here and there.

Pathology.—On section and microscopic examination the tumour was ascertained to be a chondrifying sarcoma.

After-progress.—After the operation there was practically no shock, and the patient both felt and slept well. The wound was dressed six days after the operation, and had healed by first intention.

Result.—On the seventh day she left the hospital, feeling quite well. On June 16, 1905, she came up to the hospital. She was perfectly well and there were no signs of recurrence or dissemination.*

Case 2.—T. T., age 62, retired stationmaster. This patient was first in the hospital in June, 1904, when a burn scar epithelioma was removed from the left hand, and at the same time some enlarged glands were dissected out of the supratrochlear region and axilla, but the portions of those submitted to microscopical examination did not, like the sore itself, show any evidence of malignant infiltration. In September of the same year he was re-admitted, the sore on the hand never having healed, and showing signs of malignancy to such an extent as to require amputation through the lower third of the fore-arm. The wound healed by first intention, and the patient left hospital quite well, having gained 4 lb. since the operation. On February 13, 1905, he was again admitted for pain and swelling of the left arm, and he gave the following history :—

In November last he began to feel the cold very much in his left arm and forearm, and at about the same time his arm began to swell. A few weeks later he had pain in the arm and elbow, which was of a dull, aching, continuous character, radiating from the elbow to the shoulder ; it was worse at nights, preventing sleep. The pain was continuous up to admission, and the swelling had gradually increased. About three weeks before a

* *Within a year she died with secondary growths in the lungs.*

definite swelling about the size of a pigeon's egg appeared suddenly in the axilla. His doctor incised it, and it had been discharging since. He had lost weight lately.

State on Admission.—He looked fairly well, though much thinner, had a poor appetite, and slept badly on account of pain in the arm. He had no elevation of temperature, and the heart and viscera appeared to be healthy.

Locally there was marked swelling from the amputated wrist to the shoulder of the left arm, and in some places the skin was shiny and smooth. The scars at the seat of amputation and in the supratrochlear region were perfect.

The arm could not be abducted from the chest, and the elbow movements were interfered with, the latter being probably due to the œdema. A sinus was discharging pus from the upper part of the axilla, and the skin of the axilla and its neighbourhood was brawny, red, and infiltrated. Enlarged fixed glands were felt on the internal axillary wall. No enlarged glands could be felt in the left posterior triangle or in the right axilla.

Diagnosis.—The case was viewed as one of secondary malignant growth in the axilla, involving the nerves and blood-vessels of the arm.

Operation.—At the operation, performed on February 16, the incisions were so planned as to tie the subclavian artery immediately outside the scalene muscle and to remove the whole of the skin and muscles on the upper part of the chest along with the axilla and its contents, the flap to cover this large raw area being borrowed from the deltoid area of the upper arm. The glands, which on exposure were found to be enlarged, were entirely excised from the lower part of the posterior triangle. A gauze drain was left in four days, when the first dressing was removed, and the sutures left temporarily untied over the gauze drain were finally tied.

Pathology.—The arm was in a condition of solid œdema, all the glands in the axilla were infiltrated with growth, microscopically epithelioma, and on making serial transverse sections of the arm the infiltrated lymphatic vessels were well seen.

After-progress.—Patient left hospital fifteen days after the operation, the wound was quite healed; he was greatly improved in health, and free from pain. Shortly after his return home little nodules were noted in the skin around the scar, in a few days the scar began to break down, and very soon did so completely, the ulceration spreading over the side of the thorax from the clavicle to the last rib, and from spine to sternum.

Result.—He died from exhaustion fifteen weeks after operation, without ever exhibiting signs of internal dissemination.

Case 3.—The patient was a man, age 24, admitted to the Royal Infirmary in October, 1902. Five months before admission he began to have pain in the left shoulder, which he set down as rheumatic. Six weeks before coming to hospital the pain got much worse, and the joint began to swell. Three weeks later his own doctor made an incision into the lump, and removed a piece for examination; this turned out to be sarcoma. From this time the swelling rapidly increased in size.

State on Admission.—When admitted to the hospital the man looked thin and ill, but there were no signs of growth in the internal viscera. There was a very large swelling in the position of the upper end of the left humerus, and growth protruded from the old incision.

Operation.—On October 10 the arm and shoulder girdle (outer half of clavicle only) were removed. There was nothing in the operation deserving

of note except that the great nerve trunks were injected with a 4 per cent solution of cocaine; there was practically no shock. The tumour proved to be a periosteal sarcoma of the round-celled type.

Result.—On November 3 he went to his home. The wound was perfectly healed, and his general condition much improved. Shortly afterwards he developed pleurisy, with bloody effusion, and had blood-stained sputum. Death occurred on December 31, 1902, just over eleven weeks from the date of operation.

PATHOLOGICAL SPECIMENS.

(*Northumberland and Durham Medical Society and Journal*, 1905, p, 15.)

Mr. Rutherford Morison showed the following specimens :—

1. *A portion of hayfork*, five inches long. It had lain embedded in the base of the skull for 2½ years, without causing inconvenience.

2. *An end-to-end anastomosis* of the small intestine made by Mr. Morison's decalcified bone button. The anastomosis was perfect, and the death of the patient was due to causes not connected with the anastomosis.

3. *Two of the bone bobbins* (*a*) from a gastro-enterostomy four days after operation. It showed very evident signs of commencing absorption. The patient died from regurgitant vomiting. (*b*) From a patient who died five days after an ileo-colostomy. The button was practically unchanged. Death was due to peritonitis from leakage at the site of anastomosis.

4. *A simple stricture of the pylorus* on the scar of an old ulcer.—The patient was a man of 63. Twenty years previous to his fatal illness he had an attack, in which stomach symptoms were prominent. After being laid up for twelve months he completely recovered. For two years before death he had abdominal pain and vomiting. Operation was postponed for too long, and after he consented he was never well enough for one to be performed. At the necropsy the stomach was found to be enormous, almost filling the abdomen. The pylorus was fixed to the pancreas, and was so much constricted that the little finger could not be passed through it.

5. *A pin-point prepuce* removed from a man of 26 who had three children. The prepuce had always been long, but became so tight that the urine filled it out like a balloon, and only slowly escaped through the tiny orifice.

6. *A Murphy button retained in the stomach for three years.*—The patient was a woman of 46. Gastro-enterostomy was performed at another hospital in May, 1901. The anterior operation with the Murphy button was employed. She made a good recovery, but the button was not passed. As she complained of a severe gnawing pain, the surgeon re-opened the abdomen in November, 1901, but failed to find the button, although its presence was demonstrated by the *x* rays.

In May, 1903, she was admitted to the Newcastle Infirmary. She was thin and anæmic, and complained of severe pain, but there was no vomiting. It was suggested that her symptoms were due to absorption of copper from the button, as a green line was noticed on the gums. With the fluorescent screen the button could be seen lying to the right and above the umbilicus, and moving with respiration. The stomach was again re-opened and the button removed from the pyloric end. The patient made a good recovery, with complete relief of all her symptoms.

Mr. Clague carefully weighed the button, and by comparison with others of the same size, he calculated that it was 137 grains below the average weight. It had, therefore, lost a weight of metal equal to a bronze penny. This, reckoned as copper sulphate, would equal 529 grains.

Dr. Bedson made a chemical examination of a portion of the metal, and found it contained 26·1 per cent of copper.

CASES EXHIBITED.

(*Northumberland and Durham Medical Society and Journal*, 1905, p. 20.)

CASE 1.—*Tuberculous ankle—Septic, with large sinus—Astragalectomy—Cure.*

Duration of Illness before Operation.—Twelve months.

Operation (seven years ago).—Splints for three months after operation. Has been healed completely for 6½ years.

Sept. 11, 1904.—Perfect; incision sound; movements at ankle perfect; walks, runs, dances normally.

CASE 2.—*Tuberculous knee—Excision.*—J. H., age 56.

Symptoms.—Twelve months' duration before operation; no sinuses.

Operation (ten years ago).—Splints worn for nine months. Has been working regularly for five years.

Sept. 11, 1904.—Perfect; firm bony ankylosis; walks remarkably well. General condition good.

CASE 3.—*Tuberculous hip—Hole through acetabulum into pelvis.*—H. H., age 10.

Operation (Nov. 17, 1903).—Excision of hip. Splint (Thomas's) only removed at night.

Sept. 11, 1904.—Wound sound; no active signs; walks well; some degree of movement at hip. General condition good.

CASE 4.—*Tuberculous elbow—Excision.*—W. H., age 15.

Duration.—Four months.

Operation, June 2, 1903.—Healed up straight away, and remained healed for fourteen months, when he received a kick on it, and it broke down again.

Sept. 11, 1904.—Movements very good and very strong; small granulating area over internal condyle.

CASE 5.—*Tuberculous hip-joint disease.*—E. P.

Operation, August, 1901.—Excision of hip.

Sept. 11, 1904.—Perfect; wound sound; walks well. General condition excellent.

CASE 6.—*Tuberculous elbow—Septic, with numerous sinuses—Excision.*—F. C.

Duration.—Six months before operation.

Operation, May 23, 1901.—Discharging sinuses remained until one year ago. Since then wound has been firm.

Sept. 11, 1904.—Boy fat and well; wound sound; movements very good, but not very strong.

DISCUSSION ON PAPER ON INTERESTING CASES BY DR. J. W. SMITH.

(*Northumberland and Durham Medical Journal*, 1905, p. 35.)

Mr. Rutherford Morison: The great interest aroused by Dr. Smith's paper is largely due to the suggestions stimulated by its perusal.

I hope you will not think I am wasting your time by telling you some of the points which have most appealed to me.

The importance which Dr. Smith attaches to the general practitioner and his responsibilities has been more and more impressed upon me. It is not too much to say that in the most serious cases met with in practice, viz., in abdominal emergencies, the fate of the patient depends more upon the practitioner who first sees him than upon anyone else.

If Dr. Smith's paper had been a sermon, his text would have been—*The Importance of Early Diagnosis;* for on this depends a proper prognosis and suitable treatment.

Thirty years ago, in the treatment of acute abdominal disorders, there were only two alternatives—opium and castor oil—and in the most serious cases it really did not much matter on which the choice fell. The most important therapeutic advance that has ever been made was the use of the knife.

This once introduced, the surgeon did not fail to avail himself of the opportunities offered; and his success has left a slur on those physicians who are not progressive enough to accept of his help.

But I do not think that the artificial barriers which have separated the physician from the surgeon in the past are likely to remain; and in this I am supporting Dr. Smith.

By nature the physician is a pathologist and a pessimist, and his tendency is to leave undone those things which ought to have been done. The surgeon naturally is an operator and an optimist, and his tendency is to do things which he ought not to have done; so that the physician and the surgeon form a valuable combination, but are not to be trusted to act alone.

To be able to operate well is a great recommendation, but it is not the only nor even the chief one; and my impression is that the physicians may recover their lost ground by further attention to diagnosis and prognosis in such directions as we already see indicated—mostly, I regret to say, from abroad.

For example, Mickulicz states that no patient recovers from an operation if the percentage of hæmoglobin is much reduced. Halstead has a record of the blood-pressure kept during his operations, and is warned to stop when it approaches a dangerous depression. The freezing-point of the urine is said by Ogston—that of the blood by Kümmel—to be an invaluable guide as to the capacity of a patient to struggle against disease or injury or operation. Chemical changes and the microscope are not sufficiently studied in the surgical wards; they would be if the physicians and surgeons both had charge of the patients, and took a mutual interest in them.

A not uncommon belief is, that too many operations are performed now, and I do not doubt that in many directions this is true. Dr. Smith has mentioned a striking instance of this in the case of appendicitis. It has taken us a long time to find out that when general peritonitis is present—with a distended, tense abdomen—operation may be worse than useless, and the

patient may have a better chance of recovery without it ; and we now know that much harm has resulted in the past from exploratory operations in advanced malignant disease, on the off chance that the diagnosis may have been wrong. Operations, too, for fixing mobile kidneys, for the separation of gastric and intestinal adhesions, and for other conditions, the supposed cause of ill-defined symptoms and general disturbance of health, generally do more harm than good. If good follows, and it occasionally does, it may not be dependent on the operation as a surgical procedure, but on enforced rest following it, and the mental effect preceding it.

Whilst admitting that in these and similar directions too many operations are being done, I believe that in other directions enough are not done, and that the future will see a large increase in their number.

The chief objects of the best operations are, and should be, to check hæmorrhage and to prevent sepsis.

Let me illustrate my meaning by an example.

A robust man was admitted to the Royal Infirmary under my care a few days ago, with a compound depressed fracture of the skull. He walked in, and had no symptom whatever of serious injury. On examining the scalp wound with a finger, a hole in the skull and a large area of depressed bone were found.

The danger in the case was that sepsis might follow the wound, and the possibility of septic meningitis was too serious to ignore. I, therefore, turned back a large semi-circular flap, the wound being in its centre. After trephining, I elevated and temporarily removed a large amount of depressed bone. There was an opening in the dura mater. The excised bone was washed in 1-20 carbolic lotion, the fractured edges were clipped away, and, after steeping in saline solution, the bone was replaced. A packing of iodoform gauze was laid between the scalp and the bone, the lacerated scalp wound was trimmed and laid over the gauze, a few untied sutures being inserted in the scalp. In four days—the temperature meanwhile having been normal, and the wound showing no sign of infection—the iodoform gauze was removed and the sutures were tied. The sole object of this serious operation was to prevent a probable sepsis, and our experience in the Infirmary has shown us the advantage of this. Septic infection, once fairly started, is difficult to arrest ; the important point is to prevent, if possible, its occurrence.

The same problem requires consideration in many other cases, and often the responsibility of waiting is greater than that of advising operation. In the case of appendicitis we now recognize that operations performed before extensive peritonitis has set in are uniformly successful. The mortality of the disease results from operation not being done early enough to prevent septic infection of the peritoneum.

In gall-stone cases the mortality following operation is very small when the gall-stones are confined to the gall-bladder ; but when the stones have escaped into the common or hepatic duct, the mortality following operations rises to a serious figure.

I feel increasingly confident that gall-stones are a serious possession, and that so soon as their presence in the gall-bladder is diagnosed, their removal should be recommended.

In all cases the probable course of the disease and the risks, if left alone, should be compared with the probable results, immediate and remote, of operation ; and, with this knowledge as a guide, the choice should be made of that form of treatment most likely to secure the best result.

CASES OF PLASTIC SURGERY.

(*Northumberland and Durham Medical Society and Journal*, 1905, p. 281.)

Mr. Rutherford Morison showed a man of 40, on whom he had performed a plastic operation, to repair the defect left after the removal of an epithelioma of the cheek. It had been necessary to remove a quadrilateral area 2 in. by 1½ in. The gap was filled by a large flap cut from the lower part of the cheek and neck. The patient had a beard and moustache, and he had taken so much pains in their cultivation that there was no apparent deformity. Mr. Morison also showed a boy of eight, who had suffered some injury to the right elbow-joint some weeks before being brought to hospital. The arm was fixed in the extended position, and there was much thickening about the external condyle. Even with the aid of a good skiagram it was difficult to say exactly what the injury had been, and the case was presented to the meeting for diagnosis. Mr. Morison proposed to excise the lower end of the humerus. [This operation has since been carried out. Even after maceration of the bone removed it was impossible to say exactly what the injury had been. The ulna and radius were, however, seen to be normal.]

A LECTURE ON THE INDICATIONS FOR OPERATION.

(Delivered at the Polyclinic, London.)

(*The Lancet*, June 17, 1905.)

To prevent sepsis, to arrest hæmorrhage, or to remove a focus of disease—one or other of these things is, in the majority of operations, the purpose of the operator.

Prevention of Sepsis.

As an illustration of this, the following case may be given of operation after injury to the brain. One afternoon I received by telephone a message asking me to go to see a young man, age 16 years, who had injured his head, and who still bled, but not profusely. The message was not urgent; I was to go as soon as convenient. On my arrival he was in the nursery with some younger brothers, and demonstrated on the remnants of a toy cannon what had happened. In firing the cannon it exploded and something struck him in the forehead. Part of the cannon was missing. There was a small incised wound on the upper part of his forehead on the right side still slowly oozing. If I have not already conveyed the impression that he appeared to be no worse for the accident, let me say now that he was able to walk along with me to a private hospital without help or difficulty, and to run upstairs. I did what we *always* do as a matter of routine—introduced a sterilized

probe into the cleansed wound.* A finger is the best probe, but this wound was quite small. On introducing the probe I found to my horror that it went through a hole in the skull. To prevent wound infection I decided at once to operate—to trephine. On removing a disc with the trephine a hole was found in the dura mater, and on introducing a probe through this, small pieces of bone and the breech of the cannon were discovered in, and removed from, the right frontal lobe. After suture of the dura mater the wound was packed with gauze and dressed. Ten days later the wound, which showed no sign of infection, was reopened, and the skull defect was repaired by bone grafts. The patient was afterwards passed into the Yeomanry as sound, and distinguished himself in the South African war.

In contrast with the above case, which illustrates the value of probing, I will describe another in which probing was neglected. The most curious feature of this very curious case is that the results which might well have been expected from this neglect did *not* happen. A boy, riding on a hay-cart and carrying a pitchfork, fell and was carried home unconscious. A large wound on the right side of the face was cleansed and stitched, and subsequently healed by first intention. Two and a half years afterwards, when the boy was about 12 years old, the wound began to reopen. A small abscess formed and healed, and then, after a few months, a black object, *protruding about one-eighth of an inch, came through the skin.* At the Newcastle Infirmary he was seen by my house surgeon, Dr. J. W. Heslop, who easily pulled out with his finger and thumb a piece of hayfork four and a half inches long. It had apparently transfixed the antrum of Highmore and crossed the back of the nasopharynx to the opposite side of the face. The boy suffered no ill-effects from its removal, and walked away to the photographer's.[1]

The most necessary and the most successful operations are, as I have reminded you, performed for the prevention or for the arrest of sepsis. It is the best reason to be urged in favour of an operation that its object is to prevent or to arrest blood poisoning. Take the question which has been discussed *ad nauseam*, when to operate in cases of appendicitis. Operation is demanded when the risk of peritoneal infection is manifest. There is no other definite indication for operation. In cases of 'appendicitis' of the type which allows its possessor to attend business regularly and which never interferes with a dance,

* *Probes are dangerous instruments except when used as this was, immediately before an operation.*

[1] *Journal of the Northumberland and Durham Medical Association*, October, 1904, p. 357.

there is grave doubt whether the removal of the appendix is useful or even justifiable. But in cases that commence with acute pain and vomiting and are attended by inability to rest, elevation of temperature, quickening of pulse, tenderness and rigidity of the abdomen, the sooner operation takes place the better. When some doubt has been felt at first, none should remain at the end of twenty-four hours. Every case in which *all* symptoms and signs are not improved in that time requires operation; it is not enough that there may be betterment in some of them. This has been emphasized by my colleague, Mr. W. G. Richardson.[1] A rule of immediate operation in acute cases would prevent much prolonged illness from abscess and many deaths from general peritonitis; but in the peritoneum, as elsewhere, septic inflammation which has started may be impossible to arrest, and when once it has been fully established, operation frequently does more harm than good. The same truth may be recognized in other abdominal emergencies. If, for example, a ruptured gastric ulcer is not recognized till peritonitis has been established, the patient had probably better be left alone. The chief object of the operation is to prevent or to arrest peritonitis; the repair of the ulcer is only a part of this.

It is no less true of acute cases of intestinal obstruction than of these more generally recognized examples, that the most frequent cause of death is blood poisoning. Early in every acute case of intestinal obstruction that I have had the opportunity of observing, it was possible to make a diagnosis by noting the cries of the patient in response to the severe spasmodic pain and by discovering increased peristalsis which could be seen, or heard, or felt. In these cases, if they are left alone or treated medically, the prognosis is very bad; not less than 80 per cent die, while to do radical operations when the small intestines are distended and paralyzed by septic contents is usually to court disaster.[2] These cases require prompt decision. I have elsewhere[3] urged the importance of early operation. A few hours of delay may make the difference between recovery and death. Additional experience has confirmed the results I then recorded, and proved that the mortality of early operations is comparatively low—not more than 10 per cent. When the intestines are distended, my

[1] *The Lancet*, March 23, 1901, p. 851.

[2] In two papers (*The Lancet*, June 6, 1903, p. 1576, and September 17, 1904. p. 809) Mr. A. E. Barker has shown how some of the most serious cases may recover if the principle that sepsis is the chief cause of death be recognized and acted upon. By large resections of the intestine above the obstruction he removed the septic bowel with its toxic contents, and the magnificent results he records should be a revelation to surgeons. These exceptionally brilliant results, however, must not serve as an excuse for the neglect of the earliest possible operation.

[3] *The Lancet*, Jan. 31, 1903, p. 279.

rule has been to do enterostomy through the smallest possible opening with the object of arresting blood poisoning, and at a later stage, if the patient survives, to complete the operation. The danger, however, should have been foreseen and operation done to prevent sepsis at an earlier stage.

The following cases illustrate the danger of delay in operating in cases of kidney stone and gall-stone respectively. A few days ago I operated upon a patient very ill with a large swelling in the left side of the abdomen. He gave a history of twenty years' discomfort and occasional pain in the left loin. There was abundant pus in the urine which was found to come from the left kidney, that from the right being healthy. Röntgen rays showed a definite shadow in the position of his left kidney. I opened the kidney, from which a large quantity of pus escaped, and removed a large branching stone from the calices. The patient is doing well, but will only recover after a serious and prolonged illness with either the complete loss of the left kidney or much damage to it. Röntgen rays would have shown the stone before it caused septic changes in the kidney; its removal then would have been safe and satisfactory.

The same day I operated upon a patient who had gall-stones. There was a history of more than one year's duration that left but little doubt as to the diagnosis of gall-stones. In addition, his liver and spleen were large and hard and his kidneys were defective, conditions attributed to prolonged liver sepsis secondary to gall-stones. This view was based upon the fact that at least once a week he had a violent rigor followed by vomiting, a high temperature, delirium, sweating, and great prostration. The diagnosis was confirmed by operation and subsequent post-mortem examination. The liver was in an advanced stage of cirrhosis, the common bile-duct was so much dilated as to resemble the small intestine, there were a large number of stones in the ampulla of Vater and elsewhere in the common duct, the ducts throughout the liver were much dilated, and the gall-bladder was packed with stones and had leaked into an abscess of the liver underlying it which contained many stones. The kidneys were much diseased.

An early operation would have prevented all this mischief. There are far too few operations done for gall-stones, not for those cases which have advanced so far as the one just described and in which the propriety of operation is very questionable indeed, but for cases in which the gall-stones are still confined to the gall-bladder. I have expressed my views on this subject in previous papers,[1] and shortly summarized they are: that gall-stones may, like the previously

[1] See *Northumberland and Durham Medical Journal* for 1895, p. 21; *Scottish Medical Journal*, February, 1899; and again later in the *Annals of Surgery*.

mentioned kidney stone, remain *in situ* for years without causing symptoms; that the symptoms of gall-stones are only found when infection of the gall-bladder (sepsis) is superadded, and that then they become a serious possession and demand operation for their removal. I pointed out more than ten years ago[1] that gall-stones first show their presence by attacks of 'spasms' which are likely to be ascribed to stomach troubles; this fact has now been generally recognized. Post-mortem examinations have proved to me that death not infrequently occurs from gall-stones which have escaped recognition. More opportunities for pathological research in the post-mortem room would convince all unbelievers. In the later stages a large percentage of cases die as a consequence of the operation and of their enfeebled condition, while others are not cured because it is impossible to remove stones from all parts of the liver and liver ducts. When the sepsis and stones are limited to the gall-bladder, operations are safe and easy and satisfactory; when stones have escaped into the ducts and have caused liver sepsis, operations are difficult and dangerous and unsatisfactory.[2]

The fact that mouth sepsis, ear sepsis, and throat and nose sepsis are a menace to health and life is not even yet sufficiently recognized, or at least, if it is, the knowledge is not sufficiently acted upon. To remove all of these conditions should be regarded as a necessity, and if their removal, as it sometimes does, demands a serious operation or operations, these must be faced. No patient should be left with a septic focus if by any reasonable possibility it can be removed. It is only because the dangers of such foci are frequently obscured and delayed that their connection with serious illness has not been more often proved. It is often even now said of persons with discharging ears that the discharge does no harm and has lasted for many years without result. Every surgeon knows the mortal consequences of middle-ear suppuration, and does not hesitate at any measure which promises to arrest it; there are other forms of chronic suppuration elsewhere not less deadly.

Arrest of Hæmorrhage.

The surgical rule is, to *see* the bleeding point in order to arrest the flow from it successfully; its importance has not been exaggerated. To comply with it may, as pointed out by Guthrie in his graphic

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[1] See *Northumberland and Durham Medical Journal* for 1893.

[2] Another argument in favour of more frequent operation has been advanced. It is said (the late Dr. G. R. Slade, *The Lancet*, April 22, 1905, p. 1059), and statistics lend weight to the statement, that cancer of the gall-bladder is no uncommon occurrence in cases of gall-stone, and that cancer follows gall-stone irritation. My own experience, which is limited, of cancer of the gall-bladder does not confirm this; so that I will do no more than mention this view.

commentaries, require a serious operation, but the advantages to be derived from it were made clear by the relation of his cases. Recent surgical advances have only strengthened his arguments. Under this heading I mention only a few points that have specially interested me.

Secondary hæmorrhage after injuries or operations is now an uncommon event, for it results from sepsis, and this we usually succeed in preventing; and possibly because of the comparative rarity of its occurrence, treatment may not always be prompt and decisive. It is often readily arrested by a pad over the bleeding point and a bandage, but recurs a few days later. If it does, the bleeding point should be *seen* and the bleeding vessel should be firmly secured. This may involve a considerable operation, but that should be no deterrent. The fact has been strongly impressed upon me that hæmorrhage which has more than once recurred is almost certain, sooner or later, to lead to a fatal result unless boldly attacked.

Some years ago it appeared to me probable, arguing from this analogy, that hæmorrhage from a gastric ulcer if it recurred was likely to proceed to a fatal issue without operation, but a larger experience has taught me that this is an exception to the rule. It is, however, probable, in spite of the difficulty of finding the bleeding point, that in cases of recurrent hæmorrhage from the stomach the safest course is to operate.*

The symptoms and signs of hæmorrhage into the abdomen demand immediate operation. It would scarcely have seemed necessary to me to mention this but for a recent experience. Twice within the last six months I have been asked to operate for ruptured ectopic gestation on patients dangerously ill, and have found the abdomen "full of blood." In one patient the practitioner in attendance had recognized the case so early as to diagnose ectopic gestation before rupture, strong evidence of his capacity and zeal. He followed the rupture of the sac and watched the formation of a localized hæmatocele. Three weeks later, after a sudden seizure, the operation was performed. The second case had a similar history, but no diagnosis had been made till the hæmatocele stage. In both the abdomen was "full of blood." Each of the capable gentlemen who reported these cases told me the same story, viz., that they had been guided to the course they had adopted, and had been led to defer operation, by reading a recent discussion on the treatment of hæmatocele resulting from ectopic gestation. The outcome of this discussion by some of the greatest authorities on the subject was the conclusion that a large percentage of cases can recover without operation. It is, however, impossible for the greatest authorities to make a prognosis as to which cases will

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* *I feel sure of this now.*

recover if left alone, while, on the other hand, surgeons generally recognize that death after operation is the rarest event except in neglected cases. Operation for the prevention and arrest of hæmorrhage should therefore, I consider, follow the diagnosis of ectopic gestation in the present state of our knowledge. As an answer to the question, " When would you operate ? " I have given you these general indications, danger of sepsis or the presence of hæmorrhage, as the two most important guides in the decision of the question.

I will now proceed to refer to certain other problems of surgery in which the question, " When to operate," is also of vital importance.

Abdominal Wounds.

One of the " lessons of the South African war " was to leave wounds—punctured wounds at least—of the abdomen alone, and the statistics offered in support of this position, and the experience of the most competent army surgeons, are overwhelmingly in support of it. The same rule applied in civil practice ends in disaster. It should be a rule that *no wound of the abdominal wall must be left without full exploratory operation*. It is surely needless to say that by this I do not mean the abdomen should be opened, but that the track of the wound should be followed to the end. The relation of a case will emphasize the importance of this better than anything I can say.

At the end of a morning's work I met a man going into the infirmary as I was going out. He had come six miles by train, and had walked from the train to the hospital when I saw him. An hour before, whilst at a marriage feast, he put a cartridge into the fire and watched the explosion. Something struck him on the abdomen, he found that he was wounded and bleeding, and came off at once to the hospital. He complained of no pain ; his appearance was that of a vigorous man with nothing the matter. In the accident room I found a trifling looking wound above and to the left of the umbilicus, which had bled a little on to his clothing. He requested that this should be dressed to allow him to return home, and was with difficulty persuaded to stay. After proper preparation of the abdominal wall and the administration of an anæsthetic the wound was carefully opened up. To our surprise it was found to extend into the abdominal cavity. A rush of blood followed removal of the exploratory finger. The parietal wound was extended upwards and downwards, when a quantity of blood, estimated at not less than one and a half pints, was found in the abdominal cavity. The origin of this was a divided artery in the omentum which was pumping freely when caught and tied. Close to this spot, and evidently the cause of the laceration, lay the brass end of a cartridge. There was no other damage done, and the patient recovered. The whole of the incidents in this case were

a revelation, for nothing but a trifling cut was suspected, and without such a rule as I followed, death was inevitable.

Certain abdominal injuries demand immediate operation for their successful treatment, and no surgical question is more difficult to answer in an individual case than, Is it necessary to open this abdomen? The guides that I have adopted for my own use are based upon the history of the accident and the physical signs. When the history is one of a sudden severe localized blow, such as that resulting from the kick of a horse, severe visceral injury is so probable that only exceptionally should operation be delayed. When after an abdominal injury there is marked shock, careful hourly watch should be kept and the administration of opium avoided. Increasing pallor, increasing thirst, and restlessness, with increasing rapidity of pulse, suggest internal hæmorrhage and the need for prompt action. Continued severe pain, marked local tenderness, localized muscular rigidity, thirst, vomiting, and a quickening pulse suggest a leak in the gastro-intestinal tract and the need of immediate exploratory operation. It is necessary to emphasize the fact that if operation is postponed till septic peritonitis has developed—and this often does not require many hours—the possibilities are that it will then be useless and may be actually hurtful. Radical operation should never be done when the abdomen is much swollen and tense, for if the intestines are not already paretic the operation makes them so. An enterostomy under local anæsthesia is the largest operation that should be performed in these circumstances, and this may be useful whether the condition is due to mechanical obstruction or to peritonitis.

Tubercle and Cancer.

There is much that is common in the surgery and pathology of tubercle and cancer. Everyone knows the desirability of removal of the focus of disease in both, with the hope of preventing further infection and generalization, but not all act upon this knowledge. The most common form of tuberculous disease calling for surgical interference is that which results from infection of the neck glands. So far as my own knowledge goes, it would be practically correct to say that enlargement of a neck gland due to chronic inflammation is always the result of tuberculous infection. I think that every such gland is a source of danger and should be removed. When the operation is limited to the excision of a localized glandular enlargement, it is attended with little risk, is followed by a trivial mark, and the result is likely to be satisfactory. If, on the other hand, extensive glandular infection is found, neither the immediate nor the remote results of operation are likely to be perfect. The same statement may be made, though even more strongly, for cancer. In both, the best

results are only obtainable when there is local and limited disease. Though emphasizing this, I believe that a limited amount of disease, how much it is impossible to say, can be rendered innocuous temporarily or permanently by the surrounding healthy tissues. None will deny the truth of this in the case of tubercle, and I think it also holds for cancer. No other explanation can be given of the long immunity after operations, which we now regard as partial, done by the older surgeons; and nothing else will account for the delay of local recurrence till many months, or even years, after operations for cancer. Not only for tubercle and cancer is this true. The germs of a great many diseases can, and do, lie inert in the tissues ready to become active under favourable conditions, but are kept in check so long as the tissues are healthy.* This is an important view, because it will necessarily lead to an increased number of so-called palliative operations, and I believe this to be the correct action in certain cases. Contrary to accepted surgical authority, which teaches that, unless it appears to be possible to remove the whole disease, operations for cancer do more harm than good, my experience is that in selected cases a satisfactory result may follow partial operation.

In the case of tumours of the stomach and bowel it may be justifiable for mechanical reasons alone to excise non-localized malignant growths.† In other regions, too, I would suggest that when a large mass of malignant disease can be safely extirpated it should be done, even though glands or other deposits must be left, if it is in a position where sepsis is avoidable. One patient of mine, with rapidly growing malignant disease of both ovaries and small secondary deposits in the peritoneum, lived for six years, five and a half of which were vigorous, after an operation for removal of both ovaries, before her death from abdominal cancer. (The diagnosis in this case was verified by microscopical examination and by a second operation.)

How much septic infection superadded to cancer or tubercle increases the risks, multiplies the sufferings, and hastens the downward progress of the patient is not sufficiently appreciated. A single example of this in the case of cancer must suffice. I have seen a fair number of cases of cancer of the cervix uteri in virgins, sufficient to be able to make some definite statements concerning them. The disease in them is not attended by the symptoms usually associated with cancer of the cervix—viz., early hæmorrhage and profuse fœtid discharge. Hæmorrhage occurs late; fœtid discharge, if at all, not till after vaginal examination. The first evidence of cancer in unmarried women (and often in widows) is bladder trouble with pains

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* *War wounds have emphasized the truth of this.*

† *This is only now receiving due appreciation.*

in the course of one or other of the pelvic nerves. Physical examination shows an inoperable fixed mass of malignant disease in the pelvis. Acting upon this knowledge it is possible, and I have done it, to prolong the life and to remove the symptoms, in cases where a radical operation was impracticable, by arresting sepsis. The sharp spoon and regular antiseptic dressings may be successful for months, and in some rare cases for years, in removing the urgent symptoms of this dreadful disease.

A great deal of interest has been excited by the question of cancer and its recent increase, and that it is increasing out of proportion to the increase of the population scarcely admits of doubt. So far as my own experience goes, the increase is largely in cases of cancer of the gastro-intestinal tract, and especially in cancer of the colon. A very usual history in these cases is as follows. The patient, generally over forty years of age, has been latterly troubled with increasing difficulty in getting the bowels to act; more and more purgative medicine has been necessary. Flatulence has been troublesome, and flatus has been with difficulty voided per anum. Rumblings in the abdomen have been troublesome, and sometimes especially so after taking medicine. They may be sufficiently loud and disturbing to prevent ordinary social or business intercourse. Some loss of flesh is the ordinary rule, but it is not uncommon to see such patients 'the picture of health.' Physical examination of the abdomen, which is often stout, is likely to reveal nothing. Digital examination per rectum may discover through the wall of the bowel a growth in the lower end of the sigmoid flexure. If it is higher and out of reach of the finger, the sigmoidoscope may demonstrate its presence. In women such a growth is heavy, and if it occurs in the slack portion of the sigmoid flexure the weight of it makes it fall to the bottom of Douglas's pouch, and more than once I have seen it then mistaken for a hard diseased ovary. If examination fails to detect a sigmoid stricture due to the presence of a growth, yet, if not more than a pint of enema can be retained, the fact is in favour of that diagnosis. When in spite of the absence of physical signs the symptoms in a patient over forty years of age are as I have described them—viz., increasing difficulty in obtaining an evacuation, with painful rumblings, still more if there has been actual obstruction, which may be the first symptom, accompanied by increasing flatulent distention—then exploratory operation should be done without delay.* Much as I dislike exploratory operations in general, there are good grounds for it here. If a growth be found, as is probable, removal of it may cure the patient or avert by anastomosis

**X-rays and bismuth enemata can demonstrate the presence of a stricture and confirm the diagnosis.*

the need for a later colostomy, which in many instances is a worse calamity than death itself.

Tubercle of Joints.

Tubercle of joints commences, as is well known, in the bone or in the synovial membrane. It is possible now, with the aid of the Röntgen rays, to localize tubercle in the bone before the joint in its proximity is involved. Operation should then be performed with the object of removing the osseous tubercle in time to prevent invasion of the joint. If the synovial membrane is diseased, excision of the whole of it precludes the possibility of recovery with a perfect joint. This is so serious a matter that in many cases we must break the rule for tubercle—to excise all infected tissue,—and treat tubercle of the joint as an exception. In practical surgery it is necessary to think of tuberculous joints as occurring at three ages—in childhood, in young adult life, and later. In all three it may exist as simple tuberculous infection, or it may be complicated by sepsis. It is good teaching to say of tuberculous joint disease in children up to the age of 12 years that recovery without any operation will surely follow complete and prolonged rest of the diseased joint and attention to the general health. In these circumstances even septic tuberculous joints may entirely recover.

In tuberculous joints occurring in young adults before the age of 25 years recovery may be anticipated from the same measures, but interference with the functions of the joint is more likely. If recovery is to result in loss of the functions of the joint, I believe excision to be the best treatment. By excision I do not mean the operations described in text-books as such, most of which should be abolished, but thorough exposure of the joint and the removal of all diseased tissues and of the cartilage covering the ends of the bones, to allow of cure by bony ankylosis, which in advanced cases is the best result to be expected. The test I employ as to whether this is desirable or not is the amount of movement obtainable under an anæsthetic. If there is fair movement, excision is not justified, but if movement in every direction is much limited, recovery is quicker and more satisfactory after excision. After the age of 15 years and up to that of 35, if a joint is septic as well as tuberculous, excision should be the rule. A striking exception to this is met with, however, in septic tuberculous disease of the wrist, a joint which I never excise. Experience has taught me that by prolonged immobilization of the joint, treatment of the septic sinuses, and attention to the general health, complete recovery with good movement, even in the most unfavourable-looking cases, may be confidently anticipated. After the age of 35 years the prognosis of tuberculous joint disease is very bad, and increasingly

so in every advancing decade. Operations should, I think, be more frequently done and earlier than they are, for no other means offer a reasonable prospect of recovery. I have now resected joints for tuberculous infection in several patients over 50 years of age with good immediate and remote results. When tuberculosis is complicated by septic infection in elderly patients, amputation should not be delayed.

REVIEW.

(*Northumberland and Durham Medical Journal*, January 19, 1905.)

DISEASES OF THE PROSTATE GLAND. (By W. G. RICHARDSON, F.R.C.S., Assistant Surgeon to the Royal Infirmary, Newcastle.)

Mr. Richardson's book is a reprint of the Heath Prize Essay.

It appears most opportunely, for during last year the surgery of the prostate has been much under discussion; many points concerning it have been the subject of dispute, and some of them of disagreement that has degenerated into acrimony. The work, therefore, of a capable, original, and scientific teacher—and for those to whom he may be unknown this book is satisfactory proof of those qualities—is certain to meet with full appreciation. Mr. Richardson gives an able summary of the embryology, comparative anatomy, and pathology of the prostate. The drawings are original, and show the result of many of his own dissections and preparations; they are evidence of the labour the author has spent upon his task, and are so excellent as illustrations of the text that we are tempted to say they are the best part of the book. Indeed, every embryological, anatomical, or pathological opinion advanced in the text is supported by a description or illustration of prepared specimens; in fact, the text may be regarded as explanatory of the illustrations.

As a practical guide in the treatment of prostatic disease, the book gives sound advice, and the suggested indications for operative interference are such as would be approved by the best surgeons of to-day. No surgeon interested in prostatic disease (and who is not?) can afford to neglect the reading of this book; and, having read it, no one can fail to find it interesting and instructive. The Newcastle School of Surgery is indebted to Mr. Richardson for a piece of work which may serve as an example of what such work should be, and which cannot but add to its surgical reputation.

1906

FRACTURE OF THE PATELLA.

(*Northumberland and Durham Medical Journal*, 1906, p. 4.)

Mr. Rutherford Morison showed a series of patients who had been treated for fracture of patella, five by open incision and suture of the fragments with strong catgut, and two without any operative interference.

Cases after Operation.

1. A man, age 20 at time of operation. Simple transverse fracture. Now, eight years after operation, the patient has a perfectly sound knee, the movements are of normal range, and he works regularly as a labourer.

2. A man, age 32 at time of operation. Simple transverse fracture. Now, seven years after operation, the patient has a perfectly sound knee, the movements are of normal range, and he works regularly as a tugboat man.

3. A man, age 47 at time of operation. Simple transverse fracture. Now, five years after operation, he has a very useful joint. Flexion is a very little limited, and the knee sometimes fails him when carrying heavy weights upstairs. He works regularly as a carman.

4. A man, aged 67 at time of operation. Simple transverse fracture. Now, one year and eight months after operation, the patient has a perfectly useful joint. Full flexion is very slightly limited, but the patient can run and jump, and was very anxious to dance the Highland fling.

5. A man, age 30 at time of operation. Simple transverse fracture. Now, eight months after operation, he has a perfectly useful knee. There is not quite such perfect flexion as on sound side, but he can follow his employment as a market porter without the least inconvenience.

In all the above examples there was firm and close bony union, and in almost every instance it was impossible to detect the line of fracture. In none of the cases was any attempt made to clear the blood out of the joint, nor was drainage employed. In the first three cases the limb was kept in plaster-of-Paris for six weeks, and it was usually three months from the time of the accident before work could be resumed. In the last two cases no splints were employed, and the patients began to use the joint at the end of four weeks and were at work at the end of eight.

Cases not Operated Upon.

1. A man, age 36 at time of the accident. Simple transverse fracture of patella, with half an inch of separation. The patient refused operative interference. The fragments were fixed with strapping, and limb put up in Gooch splinting. The patient took the treatment of the case into his own hands, and was at work in ten weeks. Now, three years after the accident, although the fragments are separated for 1 in. and union is by

fibrous tissue, he has a perfectly useful knee, and is able to follow his employment as a navvy. Flexion is a little limited, and he has a little difficulty in raising himself from the kneeling posture. He is perfectly satisfied with the result.

2. A man, age 50 at time of the accident. Simple transverse fracture of patella, with very little separation of fragments. The patient suffered from gouty arthritis, and operation was not advised. The limb was placed between sandbags, and after the swelling went down a light plaster was applied. Now, one year and eight months after the accident, the knee is almost quite stiff, and is painful and useless.

CASES OF SEPTIC TUBERCULOUS JOINTS.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1906, p. 308.)

Mr. Morison showed two cases of septic tuberculous joints, which had been sent into his wards with the opinion that they would both require amputation.

The first was a healthy-looking man of 32 years, who at the age of 15 developed white swelling of the ankle-joint. This had followed the usual course of maltreated tuberculous joint disease. (He was under the care of a bone-setter for the greater part of the time.) One abscess had formed after another in connection with the joint, and the scars from several abscesses in the popliteal space and the groin of the left side were left as proofs that the disease had extended beyond its original source. At the present time the joint was ankylosed, and there were numerous sinuses in the neighhood discharging pus freely. That the disease had existed for so long, and produced no internal tuberculous infection and no amyloid change in his viscera, was evidence of good resisting power in his tissues. That the joint was firmly ankylosed was evidence of a vigorous attempt to repair the tuberculous mischief.

The second patient was a youth, 25 years of age. For eleven years he had suffered from an affection of the knee-joint. The joint was deformed by a subluxation of the tibia and fibula backwards, the leg being rotated outwards. The lower end of the femur was much thickened, and opposite to the middle of the thickened portion there was a septic sinus discharging pus and communicating with the interior of the diseased bone.

A few years ago it would have been hazardous to attempt to save these limbs; but new methods of dealing with them had made the attempt more than justifiable. To expose a newly-sawn surface of bone to the attack of organisms capable of causing acute septic infection was, of course, the chief danger; to stir up resting tubercle was the other main risk. Both of these, he thought, could be obviated by a properly planned operation.

In the ankle case the first step was to remove the astragalus. This allowed of free access to the diseased areas. The next step was to clear out by careful dissection all tissues obviously infected by tubercle or sepsis. During these proceedings frequent irrigations of the wound were carried out. After the removal of all grossly infected structures, pure carbolic acid was applied to the whole raw surface, and this was allowed to remain in contact with the wound for a short time—about one minute. Then the

carbolic acid was neutralized by washing with spirits of wine. The whole wound was packed with antiseptic gauze left entirely open, dressed with an abundant antiseptic dressing, and the limb was kept in splints undisturbed for a week. At the end of a week the condition of the wound was inspected thoroughly. If it was quite satisfactory, sutures were inserted and the dressing and splints were removed; if not, further scraping, and carbolic applications were made till the wound seemed to be entirely healthy. Not until then was it put in a permanent dressing. At the end of six months he would expect the condition of the limb to be satisfactory, with a false but movable joint with which any work might be done.

In the knee-joint case the first step would be excision of the lower end of the femur and the upper end of the tibia; the next, removal of the whole infected interior of the femur, disinfection, packing, and splints, as in the case of the ankle. If the case took the favourable course he anticipated, the result would be that obtainable by excision of the knee-joint.

1907

(*Northumberland and Durham Medical Society: Reported in Journal*, 1907, pp. 52, 179, 181, 194.)

TRAUMATIC ASPHYXIA.

Patient, age 35, an hotel porter, while working on the lift got jammed between top of lift and a beam.

His head was pressed down on to his chest, and he was held in this position for several minutes, during which time he was never unconscious, but felt very dazed.

When admitted to hospital, half an hour later, his face was of a violet colour, and he had marked subconjunctival hæmorrhage in both eyes; also small hæmorrhages under mucous membrane of the mouth.

SEPARATED EPIPHYSIS OF LOWER END OF FEMUR.

Patient, a lad, age 18, while trying to jump over a garden seat his leg caught in the back rail, and the whole of his body weight was thrown on to his leg. Epiphysis remains *in situ*, and separated lower end of diaphysis is displaced forwards.

Replaced under anæsthesia, apposition, as seen by *x* rays, quite good.

TWO CASES OF SCIRRHUS OF BREAST (TYPICAL), WITH MUCH THE SAME HISTORY.

Middle-aged women; no pain; hard swelling in breasts, with marked puckering of skin: glands in axillæ. Both cases had quite a short history, and were operated upon shortly afterwards.

CIRSOID ANEURYSM.

Mr. Rutherford Morison commented on the rarity of the condition in the limbs. He referred to a similar case in which the foot was involved, and in which he tied the anterior and posterior tibial arteries. No benefit resulted from this procedure, so an attempt was made to dissect out the aneurysm, but the hæmorrhage was frightful, and the operation had to be abandoned. The patient recovered, but the aneurysm still persists.

CELLULITIS OF HAND AND ARM UNDER TREATMENT BY BIERS' METHOD.

The patient was an adult male, with severe cellulitis following an infected wound of the little finger. He was treated by incisions and passive congestion, the bandage being applied for twenty-three hours out of the twenty-four. All the acute symptoms very soon subsided.

REVIEWS.

(*Northumberland and Durham Medical Journal*, 1907, pp. 169 and 171.)

GALL-STONES AND DISEASES OF THE BILE DUCTS. (By J. BLAND-SUTTON.)

Mr. Bland-Sutton's book is intended to fill a gap in the literature of gall-stones. It is for students, and to come between the inadequate account of the text-book and the too large monograph.

A boiled down account of the subject would have met these requirements, but his book, as would have been expected from the author, gives much more than he promises. It is an original, singularly lucid account of the pathology and treatment of gall-stones which none of us can read without advantage. The illustrations are so good and so clear that for these alone the book is well worth having. We note with interest Mr. Bland-Sutton's definite statement, p. 150, that "the colic associated with the movement of gall-stones in the ducts, a stone in transit along a ureter, or a fœtus through the mouth of the uterus, is due to the same cause—spasmodic contraction (cramp) of involuntary tissue *forcing a hard body along a tube formed of involuntary muscle-fibre*."

The italics are ours. We cannot accept this statement, even on Mr. Bland-Sutton's authority, as we hold very strongly, and have thought for years, that the pains are due in each case to excessive stimulation of unstriated muscle. This excessive stimulation may be limited to the gall-bladder, as the pains are found when there is no stone in any duct. Cholecystitis and a stone in the gall-bladder are sufficient to produce it. We are glad, however, that the author confidently asserts that the spasmodic pains are of muscular origin, and does not accept the unreasonable view of others that they are the result of inflammation. Inflammation and stone are the stimuli in gall-stone cases, but not the cause of the terrible pains that accompany the 'attacks.'

We confess to some disappointment that the author's teaching is not more strongly in favour of early operation for gall-stones. If medical treatment is so unsatisfactory as he allows, and as is generally admitted, and the consequences of gall-stone attacks, when the stones have escaped into the ducts, are so frequently serious, and when operations for emptying the gall-bladder can be done with so small a risk, as we know they can be, should not the diagnosis of gall-stones carry with it the recommendation of operation? The chief object of operating would then be, as it should, to prevent the calamitous results so often seen from neglected gall-stones, and this position we feel confident will be accepted in the near future.

Possibly the conservative views of the author explain his objection to and summary dismissal of the operation he describes as cholecystendysis—called

by us cholecystotomy, to distinguish it from cholecystostomy, which involves drainage of the gall-bladder. He writes, p. 205 :—

" *Cholecystendysis.*—In this operation the gall-bladder is opened and the calculi extracted. The incision in the gall-bladder is closed with sutures and returned into the abdomen. This method is rarely practised now."

The last statement is not true of Newcastle practice. We believe this to be the best (because it leaves the parts as nature made them) and safest of gall-stone operations, and our experience of it is now considerable.* If the ducts are patent and the gall-bladder is not damaged beyond repair, there is no other gall-stone operation which yields such brilliant, immediate, and remote results. By a confusion of easily confounded terms, for which it is probable that our Surgical Registrar is responsible, the table of results (p. 228) from the list of " Operations performed at the Royal Victoria Infirmary, Newcastle-on-Tyne, for the Relief of Gall-stones during 1905 " is not accurate in the designation of the character of the operations performed. Under the heading of cholecystotomy all operations for opening the gall-bladder are included. As we have said before, in some of these cases cholecystotomy (opening and immediate closure of the gall-bladder), and in others cholecystostomy (opening and drainage of the gall-bladder), was performed.

Though we have ventured to make these minor criticisms, it is not to be assumed that our appreciation of the work is small. What Mr. Bland-Sutton writes cannot fail to be instructive and interesting, for his teaching is always of his own knowledge, and offered in such a manner that it cannot fail to impress the dullest or to stimulate the most jaded intelligence.

MANUAL OF SURGERY. Vol. I. General Surgery (second edition). (By THOMSON and MILES.)

The short time (two years) which has elapsed since the first edition of this book was published, confirms the very favourable estimate which we expressed in our previous review of it.

The second edition is an improvement on the first, especially in the matter of illustrations, some of the crude drawings of the first edition having been replaced by others, of which the least that can be said is that they are excellent for teaching purposes.

In comparing this with other text-books, we have been most impressed by the amount of information contained in it. All ordinary surgical injuries and diseases, so far as Vol. I. covers them, are fully dealt with, but intelligible reference is made to most of the rare and even extraordinary conditions mentioned in surgical literature. The most recent methods in diagnosis and treatment have also been incorporated, and a level-headed view has been offered of their present usefulness and promise.

All this in a book of such reasonable limits means economical use of space, and this has been effected by the most skilful condensation. Such concise information is difficult to offer in a tolerable form for reading, but Mr. Thomson and Mr. Miles have succeeded in accomplishing this difficult task, and have made every chapter interesting.

For its size, this is by far the best introduction to surgery that has been published ; and if the second volume is comparable with the first, it is certain to occupy a premier place for the use of students.

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* *I still believe this.*

1908.

CANCER OF THE EXTERNAL GENITALS.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1908, p. 6.)

Mr. Morison showed cases of removal of the external genitalia in the male. The first were operated on for cancer of the penis.

Mr. Morison said that cancer of the penis in this part of the country is a relatively rare disease. Making a rough guess, he would say that for twenty cases of cancer of the tongue or stomach or rectum, only one of the penis would be seen.

So far as he had observed it occurred in three typical forms:—(1) As a superficial, hard, slowly ulcerating patch on the glans penis which had long been affected by chronic white patches—leukoplakia. This condition also was a precursor of cancer in the neighbourhood of the clitoris in the female, as it was in the tongue of both sexes. On the penis it appeared to be a relatively benign affection, as he had cured it by deeply shaving off the diseased patch; (2) As a stony, hard, infiltrating growth of the penis which ulcerated late, infected the glands early, and ran a rapidly malignant course; (3) As the ordinary fungating epitheliomatous ulcer, and it was to this class that he wished to draw attention to-night.

Dr. Robson had looked up his notes and found a record of six cases operated upon since 1902. He was surprised and gratified to find that in no case had there been any recurrence of the disease, though in all it was advanced and extensive at the time of the operation.

The operation has been the same in every instance, and two cases have presented themselves for inspection to-night.

The inguinal glands on both sides were first dissected up and turned into the middle line, then the spermatic cords on both sides were clamped, ligatured, and divided, then the suspensory ligament of the penis and the dorsal vein were cut and tied.

The front wound was then covered up, and the patient was placed in the lithotomy posture and an incision was made on each side of the scrotum close to the thigh and on into the perineum. The corpus spongiosum was then exposed and separated with its contained urethra, the corpora cavernosa were each divided close to their attachment to the pubic ramus, and the whole mass, consisting of inguinal glands, penis, scrotum, and testicles, was taken away in one piece.*

The T-shaped wound resulting was sutured, the urethra first being split and attached to the skin on either side.

The operation performed in this way was attended by only a trifling loss of blood, and no patient had died from it.

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* *This is an excellent and successful operation. Removal of the scrotum and testicles is essential to complete success.*

The after-result, as could be seen, was very satisfactory. The patients appeared to be contented and in perfect health, and they said that mentally and physically they were as well as ever they had been.

The third patient shown was a man on whom the same operation had been performed for impassable strictures of the penile urethra, with elephantiasis of the serotum and penis, and who had passed all his urine by fistulous openings in the perineum.

His general condition on admission was exceedingly bad, and the condition of his penis made the introduction of any instrument impossible. The man now appeared to be in excellent health, had no trouble with micturition, was quite contented with his lot, and was able to do his work as well as ever.

Reports on Six Cases.

A.—For Epithelioma of Penis.

1. J. R., aged 63. Complete operation, February, 1902. Died January, 1907, from heart disease. There was no return of local condition and no trouble with micturition. He was exceedingly cheerful, and often said he had never been better in his life.

2. C. T., 55. Complete operation, July, 1902. In December, 1907, patient was very well mentally and physically, there was no sign of recurrence, and no difficulty with micturition.

3. E. W., 55. Complete operation, January, 1906. In December, 1907, patient in perfect health, mentally and physically. No sign of recurrence, and no trouble with micturition.

4. E. H., 71. Complete operation, October, 1906. Patient died in October, 1907, from bronchitis and heart disease. There was no local recurrence, and no trouble with micturition.

5. E. D., 32. Complete operation, November, 1907. Patient making a good recovery when shown at the meeting.

B.—For Chronic Lymphangitis.

6. W. M., 46. Complete operation, October, 1902. Shown at the meeting December 12, 1907. He is fat and well, both mentally and physically. No difficulty with micturition.

SPECIMENS.

(*Northumberland and Durham Medical Society: Reported in Journal*, 1908, p. 47.)

1.—Malignant Tongue and Tonsil.

Mr. Morison: At the first operation the jaw was split and the whole tongue and left tonsil removed. At the second operation, twenty-eight days later, the whole of the left sternomastoid muscle, the internal jugular vein, and the neck glands were removed.

2.—Scar Epithelioma of the Arm.

The patient was burned forty years ago; since then there has always been a small irritable area, on which the present growth began six months ago. The axillary glands were also involved.

3.—Giant Lipoma of Arm.

The tumour was about 2 feet long and 9 inches in diameter; it roughly resembled a fœtus. It was removed from the forearm of a woman of 60, and had been growing for forty years. It gave rise to no inconvenience except from its weight.

4.—Specimens from Cases of Astragalectomy.

a. Compound dislocation of astragalus.
b. Fracture of astragalus.

DEMONSTRATION OF BONE SARCOMATA.

(Reported in *Northumberland and Durham Medical Journal*, 1908, p. 58.)

These tumours, though comparatively rare, are of great practical importance.

Myeloid.—The least malignant type are usually only locally malignant, i.e., if completely removed recurrence is unlikely. The upper end of the tibia and lower end of the femur are their favourite sites.

Their history is one of long duration—several years—and steady increase in size. They are globular in shape, have an abrupt margin, smooth surface, the bone below them is normal, and the articular cartilage above sits on them like a soldier's forage cap and is not diseased.

When the bony capsule which covers and surrounds them is thin, egg-shell crackling may be elicited. This must be distinguished from the crepitus which may be found in some periosteal sarcomata where bony spicula or plates are fractured by pressure. When the growth has destroyed the bone capsule, in parts soft areas may be found, and a further destruction of the capsule allows pulsation to be felt in some cases, and a bruit to be heard in others.

The importance of recognizing these growths was demonstrated by the exhibition of a man, 35 years of age, who had a very large tumour in the upper part of his tibia of seven years' duration. Though it was doubtful from the size of the growth (it was as large as a fœtal head at term) whether amputation would not be necessary, it was decided to endeavour to avoid this measure. A year ago the front of the bony capsule was excised and a large quantity of soft growth scooped out with a big sharp spoon, the bone cavity being swabbed with pure carbolic acid followed by alcohol.

When the man was shown at the meeting the leg was entirely healed, the immense cavity which at first required four yards of gauze to fill it had so contracted as to leave the bone little altered in shape and quite strong.

The conditions found in this case, and illustrated by the specimens exhibited, were typical of the least degree of malignancy.

The next specimens he demonstrated illustrated the highest degree of malignancy. They were the *periosteal sarcomata*.*

But it is not all periosteal sarcomata that are possessed of this special malignancy and it is important to recognize those likely to have it from those more unlikely.

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* *If there is such a thing it is very rare. All I have seen in museums or by x-rays show bone lesion. It is probable that all commence in the bone.*

The points to which he would draw attention were :—

First : *The special seat of election of these growths.* The great majority occurred in the neighbourhood of the epiphyses, and it was an interesting fact that two of the most active epiphyses (upper end of humerus, lower end of femur) were their favourite sites.

Second : That the most malignant type developed before the ossification of the skeleton was complete, and so far as he had seen, those developing after this period were less malignant, and, indeed, might last for years.

Third : The value of x rays as a means of diagnosis (photographs were shown illustrating this point) ; and

Fourth : The disappointing results of radical operation in the periosteal sarcomata of young people. Two patients on whom he had performed inter-scapulo-thoracic amputation for periosteal sarcoma of the upper end of the humerus, some two years ago, both died within a year without local recurrence, but of growths in the lung.

It was not now that he could discuss alternative methods of treating these cases, but serious amputations should, in his opinion, be abandoned.

There was only one further point to which he would like to draw attention, and it was of diagnostic value and had stood him in very good stead on at least two occasions. Two patients as to whose condition he had been consulted were treated for months as cases of ' sciatica.' In both, beyond some fullness of the buttock, when the patient was lying on the face, nothing was noticeable. The stethoscope discovered a well-marked prolonged bruit over the larger side. Both had endosteal sarcomata of the ilium, which caused their death.

NOTES OF A CASE IN WHICH A PORTION OF A LUNG WAS EXCISED.

(*Medical Press and Circular*, October, 1908, and Medical Society of London.)

The patient was a married woman, age 36. In the early part of July, 1906, she consulted a dentist. ' Chloroform ' was administered by a surgeon, and a considerable number (six or eight) stumps were extracted from both jaws. On recovering from the anæsthetic she discovered a stump lying loose between her cheek and gum, and spat it out. At the same time she felt difficulty in breathing and a tightness in her chest, and felt sure that a " stump had gone down her throat."

From the first she was troubled with a cough, though previously she had been quite well, and a few days later noticed a pain in her chest, chiefly under the breast-bone. Three weeks later she began to expectorate a thick tenacious green sputum. In October, 1906, she had a bad sore throat, lost her voice, and spat blood along with the thick sputum for fourteen days. In December, 1906, she again spat blood, but only for one day.

In January, 1907, her tonsils were removed, with the object, she states, of removing her cough. Shortly after, the pain returned in her chest. In March, 1907, she was very ill, weak, coughing badly, and bringing up a profuse fœtid expectoration, not blood-stained. At this time she was entirely confined to bed for three weeks, and was an invalid for ten weeks. She gradually improved and went away for change for seven weeks, and though her cough did not leave, she got stronger.

In September, 1907, she again spat blood, and a bad pain appeared in her left side. In December, 1907, she was so ill that she was again confined to bed, expectorating profusely a horribly offensive tenacious fluid, and feeling very weak. Slow improvement followed till April, 1908, when the cough got worse, pain was felt in both sides of her chest, and the fœtid expectoration increased.

I saw her first on May 25, 1908, nearly two years after the dental operation from which she dated the commencement of her illness. She was sent by an eminent practitioner, with the diagnosis of "a tooth impacted in a bronchus." She looked pale and weak, was frequently worried by a cough, and expectorated with difficulty a quantity (about 1 pint in twenty-four hours) of most offensive, greenish-white fluid. The same day she was admitted into Dr. Drummond's ward in the Royal Victoria Infirmary for observation and treatment, and there she stayed till July 22 (one month).

The diagnosis made by Dr. Drummond was that she had bronchiectasis, limited to the lower part of the left lung, and though Röntgen-ray examination showed no tooth, both of us believed, from knowledge of similar cases, that the mischief was due to an impacted tooth. The prognosis made by Dr. Drummond was that she could not get better, and he entirely approved of my suggestion that the lower part of the lung should be excised.

One hour before operation the patient was placed in such a position, by raising the foot of the bed, that her head was down and her feet up, and in this position she was encouraged to empty her bronchi by forcible coughing. When this had been accomplished, $\frac{1}{4}$ gr. of morphia and $\frac{1}{100}$ gr. of atropine were administered subcutaneously.

Operation, June 27, 1908.—Chloroform was administered by Vernon Harcourt's inhaler, and the patient was turned over to the prone position, with her left chest anteriorly pressing upon the table and lowermost, and her right chest uppermost and supported underneath by a pillow, the object of this being to limit mechanically the chest movements on the left (diseased) side. A large curved incision, commencing close to the outer edge of the sternum and ending just beyond the posterior axillary line, convex downwards, was made over the lower part of the chest, and a flap, including all the soft parts covering the ribs, was reflected upwards. A small opening was now made into the pleura, through which a needle, such as is used for transfusion, was introduced. During the succeeding stages of the operation between $1\frac{1}{2}$ and 2 pints of normal saline (1 dr. of salt to 1 pint of water), at a temperature of 105° F., was run slowly into the pleural cavity. After resection of 6 in. of the eighth rib the pleura was widely opened and most of the saline escaped. It was then found that the lower part of the lung was fixed by universal adhesions to the diaphragm, which were not so firm as to make its separation difficult. At this stage, but for firm pleural adhesions in the groove at the side of the spine, it would have been easy to pull out the lower lobe of the lung and complete the operation for its excision. Dense adhesions which required some cutting for their separation prevented this, and it was necessary to remove portions of the seventh and sixth ribs to gain freer access and to bring the adhesions into view. After their separation the pleural cavity was packed with gauze all round the portion of the lung to be excised. This was then drawn out, clamped across with forceps (forceps exhibited), divided beyond the forceps in four different portions, and excised without loss of blood further than what escaped from the parietes and adhesions. After cleansing the divided lung surface, the lower part of the pleura was filled by gauze wrung out of saline and dusted with boracic powder, the gauze being so arranged as to prevent contact of the cut surface

of lung or of the clamps with the pleural cavity, and to receive any discharge that might occur. The wound was left widely open with the clamps and gauze ends projecting from it, all being covered by a voluminous dressing. At the end of the operation the patient was in good condition, and but little shock followed it

After-progress.—Continuous rectal infusion of normal saline was used from the first. On the day following operation she was found lying on her left side, and looking no worse than patients do after an ordinary abdominal operation.

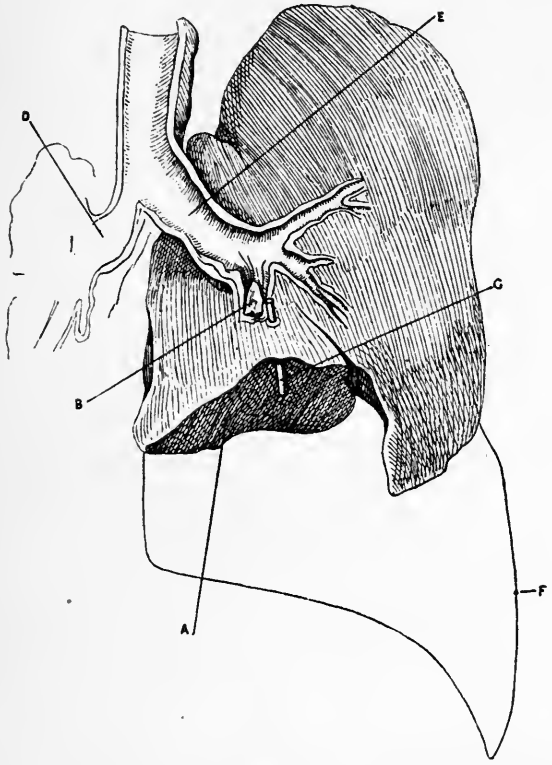

Fig. 4.—(A) Cut and healed surface of lung. (B) Stump of tooth in bronchus. (C) Probe from cut surface through open bronchus to tooth. (D) Right bronchus. (E) Left bronchus. (F) Outline of lower portion of lung excised.

The outside dressings were frequently changed, as there was considerable serous oozing from the pleural cavity.

Three days after the operation the clamps were removed, leaving the gauze *in situ.*

Five days after the operation the gauze was removed, the lower pleural cavity was cleansed, and fresh gauze was inserted.

During the first week she had no cough, and felt and looked wonderfully well.

Eight days after the operation her temperature began to rise and she had some cough, but this never became a troublesome symptom as it had been before.

Eleven days after the operation she looked ill and flushed, had a temperature of 103° F., and pulse 118. Respiration 38. It was suspected then that she had pneumonia.

Eighteen days after the operation her temperature had fallen to normal, pulse 106, and though her respirations were 40, she looked well.

From this time she steadily went down-hill, with high temperature and difficult breathing, and died somewhat suddenly twenty-six days after operation.

Post-mortem examination showed at the bottom of the wound in the chest wall a cavity the size of an orange. The wound and the cavity in the pleura were lined with healthy, clean granulation tissue. All the open bronchi, with one exception, had completely closed and were invisible. The single exception was plugged with mucus, and on introducing a probe into this, at a distance of ¾ in. from the outer surface a foreign body which felt like a tooth was struck (*Fig.* 4). That this was the missing stump can be seen in the cut specimen. The remainder of the pleural cavity was filled by the lung, which was everywhere fixed to the parietal pleura by recent lymph. Both lungs were otherwise healthy.

The pericardium, visceral and parietal, was plastered over with purulent lymph. There was nothing abnormal elsewhere. It was obvious that death resulted from pericarditis.

CASES OF RUPTURED SEMILUNAR CARTILAGES.

(*Northumberland and Durham Medical Society; Reported in Journal*, 1908.)

Mr. Morison showed a series of patients who had undergone operation for ruptured semilunar cartilages.

1. J. S., age 58, miner. This patient had his right external semilunar cartilage removed in 1900.

He now has perfect movement in the joint and works regularly without any inconvenience.

2. G. W., miner, age 64, now age 70. In 1902 he twisted his right knee whilst in a flexed position when working in the pit.

He had inability to fully extend his knee, and six weeks after injury the right internal cartilage was removed.

The cartilage was found ruptured about its middle, where a small bit was thinned out and turned into the joint.

Patient gave up working as a miner two years ago on account of old age.

He can walk quite well, and states that his right knee is as good as the left.

3. J. C., age 44, miner. In 1902 he twisted his left knee while working in the pit; most severe pain and swelling of the joint followed; he had six attacks of locking of the joint in four months.

At the operation, four months after the injury, the left internal semilunar cartilage was found torn longitudinally, with a portion projecting in between the bone ends.

Patient is able to work without any inconvenience.

4. G. T., age 58, miner. In 1906 patient had his internal semilunar

cartilage removed for repeated attacks of locking. No note of the pathology was made in this case.

Patient is now quite cured and works regularly.

5. J. C., age 46, miner. In 1906, while working in the pit, he received a blow on the inner aspect of his right knee.

He was laid up for six weeks, and on resuming work synovitis followed after the slightest exertion.

On examination there was a tender spot over the inner aspect of joint, with inability to fully extend and flex the leg.

The cartilage was found detached in front with a longitudinal rupture.

Patient, who is a big heavy man, states that except for a numbness on kneeling his knee is as good as the other one.

6. J. N., age 30. About eighteen months ago he had the right internal cartilage removed.

At the operation the cartilage was found ruptured transversely about its middle. He is able to work as a miner, and states that he is much better, but that the knee is not so strong as the left one.

GIANT NÆVUS OF SCALP.

(Northumberland and Durham Medical Society; Reported in Journal, 1908.)

7. A. V. B., farmer, age 20. Patient after removal of a nævus verrucosus of the scalp.

At birth he had a small raised patch on the top of the scalp about the size of a penny. It was covered by dark hair. The tumour has gradually grown since birth, and more rapidly of recent years.

Two years ago it began to discharge pus.

The tumour, which covered nearly the whole of the scalp, projected above the rest of the scalp, and was covered with tufts of hair.

On palpation it was soft and reduced greatly in size. No pulsation made out.

In July, 1908, the whole of the scalp was removed along with the tumour, while two lateral flaps were brought up and made to meet one another, dividing the scalped area into two parts. The rest of the scalp was grafted at a later date.

Except for a small granulating area over the left parietal bone, the wound is quite healed.*

PATHOLOGICAL SPECIMENS.

(Northumberland and Durham Medical Society; Reported in Journal, 1908, p. 247.)

Mr. Morison showed the following specimens:—

1. A series of ruptured semilunar cartilages.
2. A series of partial gastrectomies performed for cancer.

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* *It entirely healed.*

THE DIAGNOSIS AND TREATMENT OF BREAST CANCER, BASED UPON A RECORD OF CASES OPERATED UPON OVER THREE YEARS AGO.

(Discussion on the Diagnosis and Treatment of Cancer of the Breast, 76th Annual Meeting of the British Medical Association.)

(*Medical Press and Circular*, December 30th, 1908.)

A hard, nodular tumour, which puckers the skin over it, retracts the nipple, elevates the breast to a higher level than that of the healthy side, and is accompanied by enlargement of the corresponding axillary glands, in a woman over 40, cannot be mistaken for anything else. It is a scirrhus cancer of the breast—very advanced cancer, too,—and is, indeed, so serious that the outlook, whatever may be done, must not be too sanguine. Yet it is at this stage that the majority of breast cancers first seek surgical aid—months, usually, after the discovery of a tumour, and when the diagnosis is beyond suspicion or difficulty. The chief diagnostic difficulties in my experience have arisen, here as elsewhere, in saying whether the tumour is due to tubercle or to cancer. A tuberculous breast has a tumour in it (if there is more than one, this is in favour of tubercle). The tumour is often hard (if not stony hard, this is in favour of tubercle). The skin covering it may be adherent (if it is not puckered or of the pig-skin saddle variety, this is in favour of tubercle). The corresponding axillary glands may be enlarged (if not hard as well, this is in favour of tubercle). The centre of the swelling may be soft, and some œdema may be observed in connection with it. The patient is usually below 35 years of age, is often pallid and delicate-looking, and evidences of tubercle elsewhere may be discoverable.

Deep cysts and chronic abscesses in large breasts may simulate malignant growths so closely that diagnosis without incision is impossible.

It is a sound surgical rule to remove every breast tumour at the earliest convenient hour, and in the manner described by Sir Watson Cheyne—i.e., by removal of the tumour, without cutting into it, along with an area of surrounding breast tissue. This is the only satisfactory treatment, and some early and unexpected cancers will be discovered by it.

The most difficult cases for diagnosis, and the most unsatisfactory in prognosis, are those growths which resemble acute inflammatory swellings. So far as I have observed, they would appear to be hopeless from their onset.

The operation I am doing now is based upon the work of Stiles, Halsted, and Hanley, and includes removal of the whole of both

pectoral muscles, which allows of seeing clearly the whole axilla and the lymphatics on the costocoracoid membrane. If these are enlarged it is an indication for removal of the neck glands. Not only those in the posterior triangle should be taken away, but the sternomastoid should be divided, and the glands lying in the angle between the subclavian and internal jugular veins sought for and removed, as they are frequently diseased. In doing this large operation it is necessary to guard against excessive blood loss by clipping each vessel either before or as soon as it is cut, and against shock by maintenance of the body heat, and it is an advantage to define first anatomical landmarks. After reflection of the skin flaps below on to the abdomen, internally over the sternum, above to the clavicle, it is useful at the axillary side to define the cephalic vein above as the landmark separating the pectoralis major and deltoid, the edge of the latissimus dorsi below, and on the outside the axillary vein, from which the dissection should be commenced. The position of the subscapular nerve and nerve of Bell should be remembered, and, with a little care, damage to them should be avoided. The mortality from the operation is small—1 per cent in my cases.

For the purposes of discussion at the annual meeting of the British Medical Association, held in Sheffield, I obtained a full record of 115 cases, all operated upon more than three years ago. Of the 31 cases still ascertained to be alive, none complain of any lack of usefulness in the arm. This has come to me as a surprise, because I have bound every patient's arm to the body after operation, and during convalescence have ordered the arm to be used as little as possible for the first six months at least, and after that careful avoidance of any effort which caused uneasiness.* The reason for this is that I have for several years entertained the belief that, however radical such an operation may be, it is unlikely that every cancer germ has been removed, and that the avoidance of 'irritation,' which all surgeons recognize as the chief predisposing factor in the etiology of cancer, is the most likely means, next to a good operation, of averting recurrence. As a consequence of this practice, I have had no complaints about the arm in my own cases, but have, and not infrequently, from other operators' patients. In the case of young women the operation is not complete till the ovaries have been removed, as well as the breast.

There are two reasons for this.

The first is that pregnancy after an operation for breast cancer, even after years have been safely passed, practically ensures recurrence of the growth.

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* *This is still my rule.*

The second, that it has been proved by the work of Sir George Beatson, the introducer of the operation, and others, that removal of active ovaries has an inhibitory effect on the growth of breast cancer.

I do not think that treatment should be regarded as at an end when healing of the wound is completed. It is, as I have suggested, unlikely that the most complete operation has removed every cancer germ from the body; but this is, of course, no excuse for slipshod operations. It can be promised, for there is abundant proof of it, that the more thorough, on the lines indicated by pathological research, the operation, the better results have been. The late recurrences observed only convey one meaning to me, and it is that cancer germs, like those of tubercle, syphilis, and sepsis, can lie dormant, but not dead, in the tissues for years, and it is likely that they need never give evidence of their presence if the tissue dominance can be maintained.

My present practice is to order a course of Röntgen rays after operation, for I have seen beneficial results, in a single case amounting to a cure, after recurrence, follow their use.

Believing also, as I do, that cancer and tubercle have some definite, though unknown, relationship, that the individual who is predisposed to tubercle in youth is predisposed to cancer at a more advanced age, I advise the same open-air life for the one as has proved so beneficial to the other. In this connection, I may mention that in one breast operated upon for cancer in a patient, age 50, I found a calcareous tuberculous nodule under an old scar, and the patient offered the history that a quack had cured her of 'cancer' by burnings with caustic at the age of 18.

Another point worthy of note in the present uncertain state of knowledge regarding cancer is the frequency with which breast cancer has been preceded by a period of 'worry.' This is, perhaps, the best reason that can be offered for an entire change of, or, better than nothing, a variety of, environment.

One of the Infirmary cases deserves special mention, because it has been said that recurrence is an indication that further operation will be useless. Two operations had been performed during the preceding eighteen months in a distant hospital, and a recurring growth was deemed inoperable. This growth involved the scar and the pectoral muscles which had been left, and was firmly fixed to the underlying ribs. Both pectoral muscles, portions of three ribs, and the axillary contents, which had only been partially removed, were excised on May 15th, 1899. The patient continued well till 1906 (seven years later), when she returned with a malignant glandular mass in the neck. Interscapulothoracic amputation was offered, but refused, and death followed a few months later.

Oöphorectomy was performed in 11 cases,[1] with the result that 3 are alive and 8 are dead. The accompanying list supplies the most important details of each case.

Case 1.—E. R., married, age 40.
History. March, 1899.—Trouble in left breast.
July, 1899.—Breast and axillary glands diseased. Excised.
Nov., 1899.—Recurrence in scar.
Jan. 1, 1900.—Left hospital healed.
Jan. 20, 1900.—Hard growth of scar and nodules all round. Mass in axilla, great œdema of arm. Mass in right breast and axilla and right posterior triangle.
Result.—Died, February 14, 1900.

Case 2.—M. B., married, age 33.
History. Nov. 6, 1900.—Complete breast operation for advanced carcinoma.
Feb., 1901.—Nodules along scar adherent to chest wall, also mass adherent to clavicle and glands in supraclavicular fossa.
March 6, 1901.—Oöphorectomy and thyroid treatment. Nodules disappeared rapidly, and two weeks later, when patient left hospital, very little evidence of disease.
Dec. 16, 1901.—Extensive local recurrence.
June 24, 1903.—Death due to sudden hæmorrhage from axillary artery.

Case 3.—I. K., single, age 35.
History. Nov. 13, 1901.—Noticed a lump in axilla. A large mass in right breast, involving skin, also independent nodules in skin and glands in axilla and posterior triangle. No internal deposits. Oöphorectomy Nov. 13, 1902, followed by thyroid. Before leaving hospital, some nodules had disappeared.
Jan. 1, 1903.—Nodules all gone. Breast tumour a flat, soft mass; feels very well.
Feb. 2, 1903.—All nodules and glands have gone. No flushings; feels well.
Feb. 19, 1903.—Died suddenly. (Thyroid (?) poisoning.)

Case 4.—J. H., married, age 49.
History. June, 1902.—Lump noticed in breast.
Nov. 16, 1902.—Large hard mass in left breast; induration of anterior wall of axilla; enlarged glands in axilla and posterior triangle. Thin and feeble, still menstruating.
Nov. 18, 1902.—Oöphorectomy.
Dec. 29, 1902.—Breast much less and softer. No glands palpable in axilla. Those in posterior triangle smaller. Arm swollen.
Feb. 2, 1903.—Arm swollen and painful. Œdema as far as fingers. Breast tumour large and hard; also glands in axilla and posterior triangle.
Feb. 2, 1903.—Amputation through upper end of humerus; infiltration of neck prevented ligature of subclavian and interscapulo-thoracic amputation.

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[1] These are not included in the 115 of over three years ago.

Oct. 26, 1903.—Died ; whole chest wall and opposite breast involved in disease. Very little pain ; much relief from amputation.

Case 5.—M. C., married, age 38.
History. May, 1903.—A lump for some months in breast.
May 19, 1903.—Breast excised for advanced scirrhus with palpable axillary glands.
Jan. 24, 1906.—Nodules in skin of axilla and over sternum.
Feb. 2, 1906.—Oöphorectomy.
May 12, 1906.—No sign of disease, nodules all gone.
Oct., 1907.—Died ; local recurrence and in axilla and neck.

Case 6.—E. E. D., married, age 26.
History. March, 1906.—A mass in right breast and swollen axillary glands noticed for some months ; very fat woman.
March 3, 1906.—Excision of breast.
March 20, 1906.—Oöphorectomy ; left hospital well ten days later.
March 29, 1907.—Died. Recurrence in scar, breast, and spine.

Case 7.—M. C., married, age 40.
History. March 20, 1906.—Large mass adherent to skin. No axillary glands ; large glands in posterior triangle.
May 1, 1906.—Oöphorectomy.
July 16, 1906.—Growth not advanced.
July 30, 1906.—Breast smaller, also glands. Health good.
Result.—Died, August 14, 1907.

Case 8.—H. F., single, age 30.
History. Feb. 26, 1906.—Mass in outer quadrant of right breast and palpable glands in axilla.
March 3, 1906.—Complete removal of breast ; glands infiltrated.
March 13, 1906.—Oöphorectomy.
Result, March 24, 1906.—Complete recovery.
June, 1908.—Alive and quite well.

Case 9.—M. S., married, age 40.
History. Nov., 1905.—Mass noticed in left breast and axillary glands.
July 14, 1906.—Removal of breast and axillary glands.
July 28, 1906.—Oöphorectomy.
Sept. 7, 1906.—Well.
March 9, 1908.—Recurrence removed. Some infiltrated glands in the left posterior triangle.
Result, June, 1908.—Alive. Glands in posterior triangle enlarged.

Case 10.—W. E., single, age 25.
History. Large tumour. Rapidly growing cancer.
Nov. 19, 1907.—Complete removal of breast, and a few days later oöphorectomy.
Result, June, 1908.—Well.

Case 11.—E. A., age 35.
History.—Breast tumour ; scirrhus.
Nov. 11, 1907.—Complete removal of breast. Oöphorectomy a few days later.
Result, June, 1908.—Well.

Summary of Cases of Oöphorectomy for Breast Cancer.

Cases Alive.—Two cases operated in 1906.—Both had complete operations, followed by oöphorectomy in ten days. One (age 30) alive and well; no recurrence. One (age 38) alive and well; but recurrence removed in 1908.

Two cases operated in 1907.—Both (age 25 and 35) had complete operations, followed by oöphorectomy; both well.

Dead.—One case.—Complete operation, followed by oöphorectomy. Patient died within one year. Local and general recurrence.

Three cases.—Inoperable breast carcinoma. Oöphorectomy alone performed. In each case temporary improvement, but all died within one year.

Three cases.—Oöphorectomy for recurrence. In two cases improvement followed, but all died within one year.

These cases form a dismal record, but it has to be remembered that all of them were otherwise hopeless and advanced cases. In young women, especially, breast cancer is particularly malignant, and it is in them only that favourable results may be expected from oöphorectomy. A few years yet will be required to settle this question.

It is difficult in this part of the country, where a large proportion of the population is migratory, to trace patients; but, thanks to the diligent search of two of my late house-surgeons, Mr. Willan and Mr. Pybus, a sufficient number has been found (115) to prove that cancer of the breast can be permanently 'cured' by operation in a fair percentage of cases. With earlier diagnosis after the operations at present performed, a sanguine estimate may be offered.

Excision of Breast for Cancer.

Summary of cases traced to June, 1908.—Alive .. 31
Dead .. 84
115

Cases alive, 31.

Well after 5 years	2
,, 6 ,, ...	2
,, 7 ,, ...	2
,, 8 ,, ...	5
,, 9 ,, ...	6
,, 10 ,, ...	3
,, 11 ,, ...	4
,, 12 ,, ...	5
,, 17 ,, ...	1
,, 18 ,, ...	1
	31

Cases dead, 84.

Time of Death under 1 year	19
,, after 1 ,,	18
,, ,, 2 ,,	14
,, ,, 3 ,,	10
,, ,, 4 ,,	12
,, ,, 5 ,,	2
,, ,, 7 ,,	2
,, ,, 8 ,,	2
,, ,, 9 ,,	3
,, Time not known	2
	84

In addition to these, one case, which cannot now be traced, was known to be well for six years.

Causes of Death.

Recurrence	Local	21
,,	Supraclavicular glands	2
,,	Local and lung	7
,,	Local and general	4
,,	Lung	4
,,	General (not local)	17
,,	Abdomen (2)	4
,,	Liver (1)	
,,	Stomach (1)	
,,	Other diseases	6
Old age (87 and 85) (no recurrence)		2
Unknown		17
		84

1909.

INJURY TO THE SEMILUNAR CARTILAGES OF THE KNEE.

(*The Lancet*, February 27, 1909.)

Since William Hey, more than a century ago, published[1] an essay on "Internal Derangement of the Knee-joint," surgery has advanced so materially that knowledge of its pathology through operations on

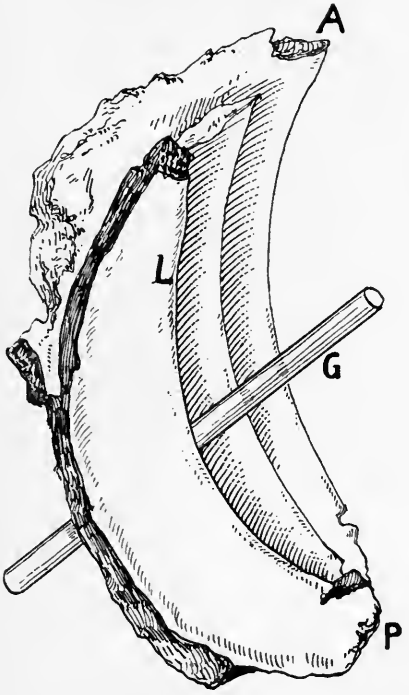

Fig. 5.—Right internal semilunar cartilage, showing longitudinal rupture. (A) Anterior end. (G) Glass rod. (L) Line of strata separated longitudinally. (P) Posterior end.

the living has now cleared up many things that were then matters of opinion only. The knee-joint has not escaped this advance, but it is because I think it is possible to make a further small addition to our

[1] *Practical Observations in Surgery*, 1803.

definite knowledge that I am induced to offer these notes on injury to the semilunar cartilages, based upon 75 cases operated upon by me from January, 1900, to September, 1908.

It appears to be assumed by authorities that the pathology of these cases is mainly a displacement of the semilunar cartilage, due to a relaxation of the coronary ligaments; but the cases I have seen and operated upon prove that this is wrong, that *the* injury is a fracture of the cartilage, and that displacement without fracture, if it occurs at all, is a very rare event. Of the 75 cases, 27 were split longitudinally, 14 were split and detached circumferentially, 8 were split transversely

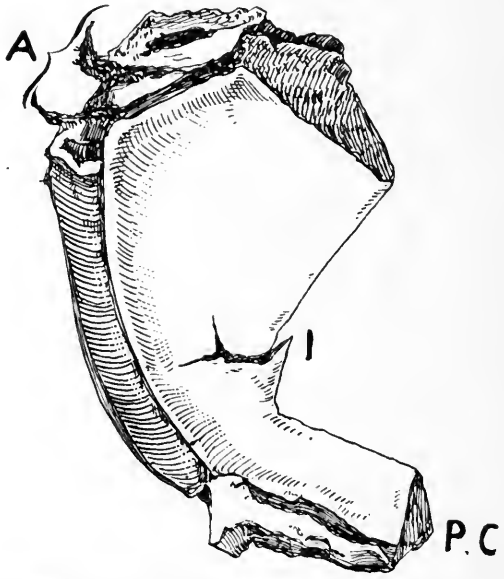

Fig. 6.—Right internal semilunar cartilage. (A) Anterior end detached circumferentially. (I) Inner border thinned out between bone ends, with transverse rupture. (P. C) Posterior cut end.

across, 6 were split both transversely and longitudinally, 5 were reported loose, and 5 were reported rupture only. Of 10 the pathology is not recorded. (See illustrations, *Figs.* 5 to 10.)

It is of some importance to note that all of the cases reported loose were done in the period when I was unable through an imperfect incision to make a satisfactory examination of the joint, and that during the last two years, since the fact that fracture of the cartilage was the true pathology occurred to me, no case of my own or of my colleagues has been seen to refute this view. On a recent occasion I would have missed the fracture had I not been convinced that it could be found if searched for; and found it was, but so far back in the joint

that it could not be seen even through the large incision I employed, till the joint was fully flexed and the cartilage was forcibly drawn forward. The chief point I want to make is that the cartilage is loose because it is fractured, and that this has considerable practical importance. This accident is a common one in miners, who work largely with their knees flexed and in awkward positions, and usually follows a twist of the flexed knee. Of 100 cases, in 98 the internal and in 2 the external semilunar cartilage are fractured. The injury is attended by

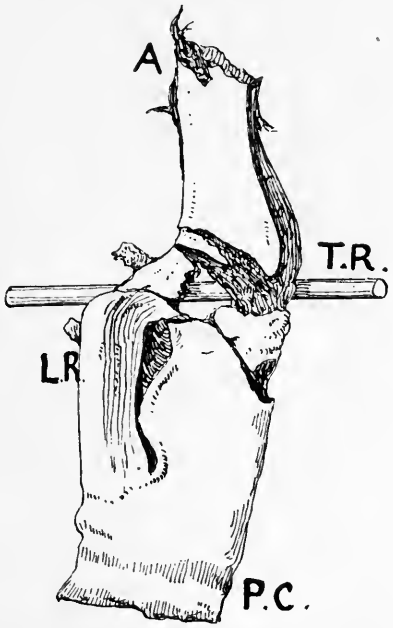

Fig. 7.—Right internal semilunar cartilage. Under surface. (A) Anterior end. (T.R.) Transverse rupture. (L.R.) Longitudinal rupture. (P.C.) Posterior cut end.

very severe pain, sometimes sufficiently serious to cause the strongest man to drop as if he had been shot, and is followed by inability to extend the joint fully, and swelling of it. Beyond this history, a twist of the knee followed by a sickening pain and two physical signs: (1) Inability to extend the joint fully, and (2) Swelling of the joint by fluid in it, seldom anything further is discovered.

In the majority of cases additional testimony is offered to the effect that reduction of the displacement with immediate relief had been brought about after certain movements, such as free flexion, with perhaps external rotation and quick extension, but that some trifling twist at a later date reproduced the symptoms and signs, and

that each recurrence seemed to make the next more easy. In the early stages, at least, except when the cartilage is displaced, the joint feels quite well, but later the joint becomes creaky and in a fair percentage of cases osteo-arthritic changes follow and gradually increase till the leg becomes seriously incapacitated. In rare cases a natural cure follows many 'attacks.' This is probably brought about by fraying out the detached portion till it is destroyed. There appears to be little difference in the liability of the joints to this accident; what there is shows a slight preference for the right, for in my 75 cases 37 were right-sided (36 internal and 1 external), 30 were left-sided

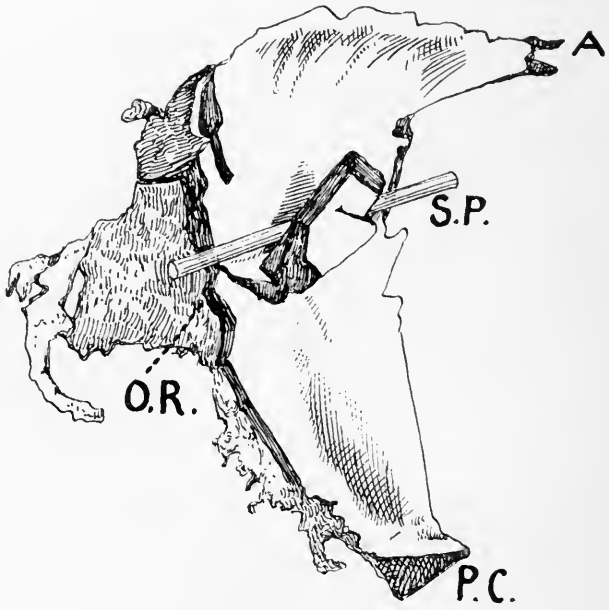

Fig. 8.—Left internal semilunar cartilage. (A) Anterior end. (S.P.) Split portion. (O.R.) Old rupture. (P.C.) Posterior cut end.

(29 internal and 1 external), 2 were both knees, and in 6 no record was made. In 89 cases during the same period from my wards, 43 were right-sided, 33 were left-sided, 2 were both knees, and in 11 no record was made.

Diagnosis.—Palpation of the joint rarely, but very rarely, discovers a portion of cartilage moving more freely than normal at the side of the joint affected. Always when the inner side is involved pressure on the anterior edge of the internal lateral ligament elicits tenderness, but this is not a typical sign, as it occurs whenever anything inflammatory has occurred in the joint, and is as certainly found

as is McBurney's point in appendicitis. The diagnosis is based upon the history of injury, the locking of the joint against full extension, and swelling of the joint following the attack. The only conditions it can be confounded with are those in which a solid resisting body falls between the articular surfaces of the femur and tibia, and these are to be found in loose cartilages or attached pedunculated cartilaginous growths. So far as I have observed in these cases, the patient has always discovered for himself the cause of the trouble, and is willing to find and can usually demonstrate it, a thing it is well to let him do. He may experience considerable difficulty in discovering the offender, but the surgeon has still more; and when he thinks he has got it, the

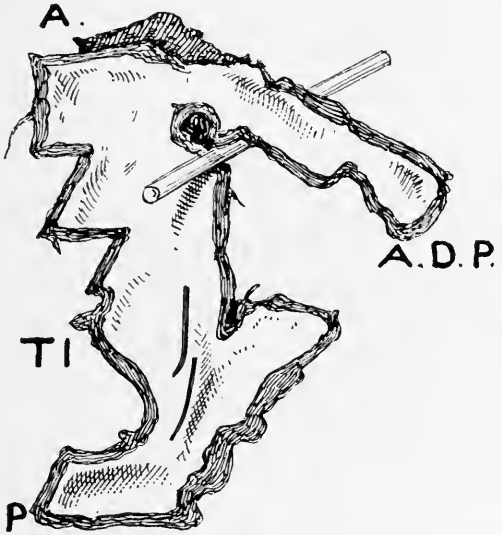

Fig. 9.—Left internal semilunar cartilage. (A) Anterior end. (A.D.P.) Anterior detached portion. (T.I.) Thickened inner edge. (P) Posterior end.

lump may easily slip back into one of the recesses of the joint and disappear, hence the appropriate German name of 'joint mouse.'

Treatment.—The first thing to be done is to move the displaced cartilage from its false position as soon as possible, if this can be accomplished. Flexing the joint to the full extent, and then extending it, may produce the desired result. If not, rotatory movements should be made, in the fully flexed position, before extension is performed. If this also fails, these attempts should be repeated under an anæsthetic. Immediate relief follows the reduction, which is often accompanied by a snap; full extension of the knee is at once possible, and all feeling of tension previously present leaves the hamstring muscles. All the

stories that have been published as to the value of this or that special manœuvre for reduction are based upon a wrong pathology, and no particular manipulation is likely to succeed if the simple ones described fail. If reduction is successfully accomplished, and this is to be known by the facts that complete and painless extension can be effected, the knee should be fixed by effective splints. For this purpose I prefer two lateral poroplastic splints, strengthened by an iron rib extending from the perineum to the sole of the foot on the inside, and from the trochanter to the sole of the foot on the outside, and fixed with straps or bandages. These are to be worn for six weeks, and with these and a patten on the foot of the sound side, and crutches, it is allowable for

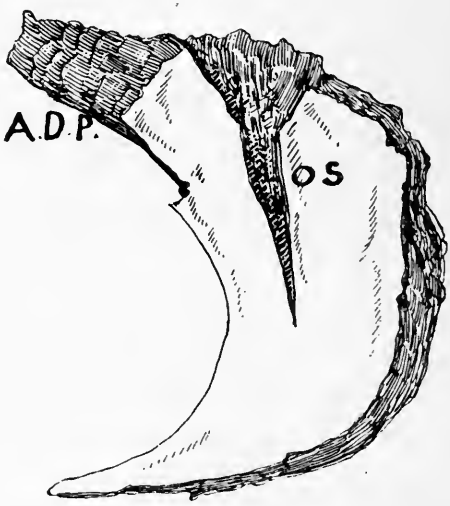

Fig. 10.—Right internal semilunar cartilage. Under surface. (A.D.P.) Anterior detached portion. (O.S.) Healed old scar.

the patient to take exercise. The object of this prolonged rest is to allow of repair of the fractured cartilage, and some of our specimens show that this can be satisfactorily accomplished. For six months at least violent exercise should be avoided, and the patient should learn to walk with the foot straight, or, better still, with the toes slightly inverted. Displacement of the inner cartilage requires that the toes should be everted, and a slight injury in this position will reproduce it. For the same reason bicycling is a good exercise, because in pedalling the foot is kept straight. If the displacement cannot be reduced, the cartilage may either be excised or the knee may be left to see if spontaneous righting occurs, as it not infrequently does. Till painless full extension can be performed splints are of no use and probably diminish the chance of replacement. If the displacement recurs, and

especially if it does so after slight provocation, a radical cure is unlikely to follow any measure but excision of the cartilage. A variety of knee supports and trusses have been invented, and if the patient prefers the wearing of such a support to the risks of an operation a suitable one can be obtained. For a man whose livelihood depends on his physical capacity and activity, such an apparatus is useless—the only thing for him is to face the operation. The danger of this must not be minimised; the operation is many times more serious than any of the ordinary abdominal operations. Surgeons do not, as a rule, publish their misfortunes, but I know of calamities, loss of life, loss of the limb, suppuration of the joint, with all its attendant and succeeding horrors, that have happened to skilful and careful surgeons. This has made me cautious in abandoning methods which have stood the test of time, and in addition to the use of sterile gloves, instruments, towels, and dressings, I interfere as little with the joint surfaces as possible, rarely using anything but instruments in the joint, using strong antiseptics (1–1000 corrosive lotion or 1–20 carbolic lotion) for everything not in actual contact with the wound, and weak antiseptics (1–10,000) as a final washing for everything else. Surgeons now realize that scientific asepsis of a wound with our present methods is an impossibility, and in advocating antiseptics it consoles me to remember that a small quantity of antiseptic introduced into a culture medium along with an organism is likely to interfere with its growth, and that even such a feeble antiseptic as boric acid will in infinitesimal quantity delay fermentative changes in milk. Notwithstanding every precaution, a large percentage of cases in which the knee-joint has been opened offer evidence of *some* sepsis. They have severe pain, some rise in temperature, local and general, swelling of the joint, an enlargement of the saphenous glands, and some of them show the red streaks of infected lymphatics. Some ingenious surgical friends suggest that this is due to the irritation of antiseptics, but that is not—considering the very small amount that can get into the wound, and the weakness of it, and our past experience with strong antiseptics in wounds—my own view. The skin over the joint is prepared the night before operation in the usual manner, and again on the table with corrosive lotion once previous to operation.

Operation.—A tourniquet of broad, strong indiarubber bandage is applied high on the thigh. After numerous trials without and with the tourniquet, I have concluded in favour of this. The knee is flexed and an incision made, as in *Fig.* 11, through the skin only. The knife with which this incision was made is now rejected as unfit for further use, and with a clean knife an incision is made through the extensor aponeurosis from the upper part of the skin incision straight over the head of the tibia. In simple, straightforward cases this

incision suffices; in more difficult ones the incision is curved backwards over the inner part of the head of the tibia, but must never divide the ligamentous structures[1] on the inner side of the joint beyond the skin incision. A free division of the ligaments here frequently results in a joint capable of some lateral movement, and consequently of a limb incapacitated for any sort of work, a fact which has only been impressed upon me since I have had to examine many miners for the compensation authorities. On dividing the strong extensor aponeurosis a thick pad of tough fat is exposed. This can be drawn forwards between two clip forceps and divided in the line of the previous incision, until the joint is opened at some depth. As soon as air gains admission to the synovial cavity the incision can be readily extended to the whole length of the preceeding one. With suitable retractors the joint cavity can now be examined, and a blunt hook under the free edge of the cartilage shows whether it is unduly loose and aids the search. If the incision is found to be too small, it is extended backwards along the head of the tibia in the joint. Through this incision the joint can be fully explored during first full flexion and then full extension, and if no lesion of the cartilage is discovered, further search must be made for the cause of offence. If the cartilage is at fault the crack in it will already have been discovered, and the cartilage is to be removed. My general plan is to divide its anterior attachment first; then, holding this in clip forceps, separate it by cutting the coronary attachment back beyond the middle line; then, dividing the cartilage transversely, remove its anterior two-thirds. More than this is not necessary and adds to the difficulties and dangers of the operation. After removal of the cartilage the wound is closed, first by a continuous suture of catgut through the extensor aponeurosis, then by a continuous catgut suture fortified by a few interrupted silkworm-gut sutures through the skin. Separate closure of the synovial membrane is unnecessary. In a single case, that of a youth with displaced external semilunar cartilage, on whom I had operated, a small hernia on the outer side of the joint followed the operation. He had used the joint as soon as the wound

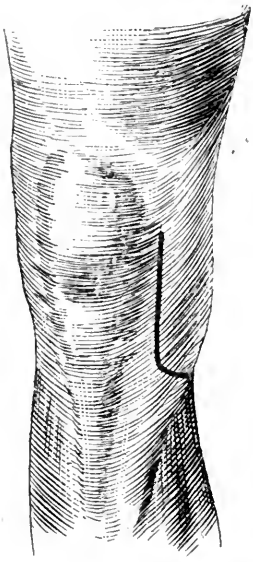

Fig. 11.—Incision for operation (L)

[1] I purposely avoid saying internal lateral ligament, for this artificial structure depends on the skilled dissection of the anatomist. All the aponeurotic structures are so welded with the ligaments as to be inseparable.

healed, and this may have had to do with the result; but it troubled him so little that he was unaware of its presence till I pointed it out. The wound is dressed with gauze wrung out of 1–1000 corrosive spirit lotion, abundant cotton-wool, and a firm bandage. When the dressing is completed, but not till then, the tourniquet is removed, whilst the limb is elevated and kept so for a few minutes. Latterly I have discarded all splints and allowed the patient to put the limb in any position he chose. Earlier I kept the knee entirely at rest in efficient splints for an average of three weeks after operation. Now one dressing remains on for three weeks instead. It was somewhat of a surprise to me to find in response to our inquiry that the splinted cases were rather better than those treated without splints. The numbers given below are of course too few, and the figures too close to draw any conclusion from, and consideration of the fact that individuality, and perhaps compensation in many cases, prolongs the period of abstinence from work after operation, has to be taken into account.

After-progress.—For a varying time after operation the joint remains weak and occasionally painful when worked, but these symptoms gradually disappear, and after the first year it is the rule for patients to say that the knee is as good as ever it was, and the cases we have inspected, numbering 20 unselected, bear this out fully. We have endeavoured to obtain the after-history of every case operated upon from 1900 to the end of 1907, not including the last year, as these are too recent to form a judgment upon.

Of 58 cases done, 17 cannot be traced; of the 41 returns, 3 cannot work and 38 report themselves able to work. The three cases that are unable to work have been seen, and all had extensive osteo-arthritis in the knee-joint, two having had it well marked previous to the operation.

All 38 successful cases were written to, and 30 of these replied.

Patients sent out With Splints.

J. S.,	age	58	years,	began	work	4	weeks	after operation.
W. H.	,,	35	,,	,,		16	,,	,,
A. B.	,,	22	,,	,,		16	,,	,,
G. C.	,,	41	,,	,,		10	,,	,,
J. N.	,,	30	,,	,,		5	,,	,,
W. C.	,,	37	,,	,,		14	,,	,,
G. H.	,,	46	,,	,,		10	,,	,,
J. M.	,,	44	,,	,,		17	,,	,,

Patients sent out Without Splints.

W. C.,	age	35	years,	began	work	24	weeks	after operation.
A. T.	,,	31	,,	,,		28	,,	,,
J. M.	,,	39	,,	,,		7	,,	,,
G. T.	,,	58	,,	,,		12	,,	,,
G. W.	,,	39	,,	,,		20	,,	,,

PATIENTS SENT OUT WITHOUT SPLINTS (*continued*).

W. C.	age	40	years,	began	work	13	weeks after operation.
J. McC.	,,	25	,,	,,		7	,, ,,
B. C.	,,	51	,,	,,		11	,, ,,
M. S.	,,	27	,,	,,		6	,, ,,
J. P.	,,	52	,,	,,		11	,, ,,
J. C.	,,	32	,,	,,		13	,, ,,
G. P.	,,	46	,,	,,		14	,, ,,
H. H.	,,	20	,,	,,		5	,, ,,
J. M.	,,	39	,,	,,		12	,, ,,
J. D.	,,	30	,,	,,		12	,, ,,
W. O.	,,	38	,,	,,		24	,, ,,
W. S.	,,	36	,,	,,		4	,, ,,
M. P.	,,	22	,,	,,		16	,, ,,
W. R.	,,	35	,,	,,		7	,, ,,
J. P.	,,	39	,,	,,		6	,, ,,
R. A.	,,	28	,,	,,		16	,, ,,
R. G.	,,	39	,,	,,		20	,, ,,

The average time before work was commenced by the patients who wore splints is 11 weeks. Those who wore no splints averaged 12½ weeks.

In connection with osteo-arthritis it was noted at the operation of several cases that there were thickened hyperæmic synovial membrane, synovial fringes, and some erosion of the cartilages covering the femur or tibia, or both. In three of these the disease was arrested by the operation, and the movements of the joints are perfect. In no single case that we can find was the joint made worse, and no patient was seriously ill after the operation.

For the notes and records of these cases I am indebted to my late house surgeon, Dr. Hamilton Drummond.

A CLAMP FOR THE FIXATION OF UNUNITED FRACTURES.

(*Annals of Surgery*, 1909.)

Because it had always appeared to me unsurgical to leave permanently buried in the tissues anything indestructible, for a considerable time, I was on the look out for some appliance which would hold together fractured bones till union had occurred, and then be removable. The case of a young man whose femur had been wired with success, five years previously, strengthened my desire; for his femur refractured at the site of union while he was walking in the street, and exploration showed that the bone had become so softened for some distance around the wire as to allow of this. The softened bone could be cut with a knife.

My late house surgeon, Mr. R. J. Willan, took up the matter with enthusiasm, and to his ingenuity I am indebted for a clamp which has served me so well that I think it should be better known.

Description of Clamp.—The clamp is made up of two halves, which are fixed together by a detachable joint. Each half consists of an oblong rim of thick tough steel with rounded corners, and with its surfaces flattened from side to side, the whole being slightly convex on its outer side and concave on its innermost side. From the middle of one long side of the oblong, and welded to it, projects the handle of the instrument, also made of steel, and one inch above the junction of the handle with the oblong portion is the site of the joint between the two halves of the clamp. Upon the inner surface of the portion of the rim opposite to where the handle is attached, five steel teeth are firmly fixed. The three central teeth project inwards three-sixteenths of an inch ; they are half an inch broad and are wedge-shaped on section ; the remaining teeth are conical and also project three-sixteenths of an inch. The free edges of these teeth are sufficiently sharp to grip firmly the surface of a bone when the clamp is applied. The handles are $3\frac{1}{4}$ in. long, and are made so that detachable handles of equal length can be affixed, a greater purchase thus being obtained in the clamping of the bone at the operation. The mechanism for screwing the clamp, when it has successfully grasped the bone ends, is a ratchet with a set screw. The size of the oblong portion varies according to the bone to be clamped ; the teeth and handles (fixed and detachable portions) are the same in all. The two halves of the instrument are united by a joint, which is detachable in order to facilitate removal.

Operation.—The technique of the operation was the same in each of the following cases. The bone ends were exposed through an incision parallel to the long axis of the bone. The fractured ends were refreshed previous to their being manœuvred into position for the application of the clamp. In an ordinary case the operation can be quickly performed. It is necessary to follow certain rules in the application of the instrument. Of the five opposing pairs of teeth, two pairs must grasp the lower fragment, two pairs the upper fragment, and the remaining pair will be in the neighbourhood of the site of fracture. Moreover, the teeth must grasp the bone about half-way between its anterior and posterior aspects. If the clamp has been properly applied, the fragments are quite firmly held together. The detachable handles are then removed and the wound sutured excepting for the point of exit of the fixed portion of the handles. An ordinary dressing, followed by many layers of sublimated wood-wool, covers the wound and buries the clamp, and the overlying bandages are starched. A supporting splint is then applied to the limb, and the dressing is not disturbed till the clamp requires removal (in from six to eight weeks).

For this purpose it is necessary to give an anæsthetic and partially open the wound, when the clamp can be rocked out by means of the handles. The second wound has always healed in the course of a few days.

Case 1.—T. D., age 51, a coal miner. Twenty-seven weeks before admission to the Royal Victoria Infirmary, Newcastle-on-Tyne, patient

was struck on the right arm by the iron socket of a broken haulage rope, fracturing his humerus. His arm was kept on an internal angular splint, with a short splint at the site of the fracture, for eight weeks. As there was non-union at the end of this time, the bone ends were wired together by an open operation at another hospital, and a splint was in addition applied for nine weeks. Upon admission on October 19, 1907, there was an ununited fracture of his right humerus at its middle. The clamp was applied and *left* on for nearly three months, when it was removed. This man has an arm so strong and useful that he is now following his employment as a coal-hewer.

Case 2.—N. H., age 57, a coal miner, was admitted in January, 1908, with an ununited fracture of the middle of his right femur. He had broken the bone ten months previously by a mis-kick at a football. He was treated by the application of a long Liston splint and extension for three months; but there was no union. He had used crutches ever since for locomotion. Upon admission there was marked deformity of the limb, with an ununited fracture of the middle of the femur, movement between the fragments being very free. There was shortening of the leg to the extent of $3\frac{1}{2}$ in. The clamp was applied for eight weeks and then removed in the usual way. The man is now in full work as a coal-hewer.

Case 3.—J. W., age 24, a motorman, was admitted in March, 1908, for disability of his right arm. He gave a history of having broken his arm three and a half years previously, owing to backfire of the motor. It was treated with splints for nine weeks. There was an ununited fracture of the ulna at the junction of its middle and lower fourth. The clamp was applied and left on for twenty-eight days, when it was removed. The bone was united. This patient's wage-earning power is now equal to what it was prior to the accident.

Case 4.—W. P., age 43, a coal miner. Eight months before admission, while at work in the mine, a fall of stone fractured his right femur. The treatment employed was immobilization by a long Liston splint, together with extension, for six weeks. This was followed by the application of plaster of Paris, which was kept on for a further eight weeks. At the end of this time, as there was still no union, the long Liston and extension treatment was resumed and continued for a further six weeks, without any union resulting. Upon admission, in October, 1908, there was an ununited fracture of his right femur at the junction of the middle and lower thirds, with deformity, marked loss of function, and great shortening. The bone ends were clamped in good position, and at the end of two months the instrument was removed, there being perfect union. The patient is now doing his ordinary full day's work as a coal-hewer.

Case 5.—H. D. H., age 28, a coal miner. Fourteen weeks before he came into hospital his right arm was run over by a tub, and both bones were fractured. The arm was splinted for six weeks in a semi-prone position, after which time massage and passive movement were employed. On admission he was a strong, healthy man. There was an ununited fracture of the right ulna, about the junction of the upper and middle thirds, and at the site of fracture there was a false joint. Both supination and pronation were limited. The clamp was applied on January 2, 1909, and it was removed six weeks later, when there was firm osseous union. He has returned to work with a useful arm.

A CASE IN WHICH BOTH PATELLÆ WERE SUTURED ON THE SAME DAY FOR DOUBLE FRACTURE.

With the Notes of a Displacement which is Against Bony Union.

(*Surgery, Gynæcology and Obstetrics*, September, 1909.)

Wiring the patella is now so common an event in surgery as to attract no attention. I have sutured the single fractured patella many times, but only on one occasion have I had to treat a fracture of both. It is probable, therefore, that the latter is a comparatively rare accident.

A recent visit from the patient whose accident has been referred to, and more than eight years after, has enabled me to obtain the accompanying photographs, which show how complete his recovery has been, and furthermore has suggested to me that I should publish the case and offer some observations I have made in connection with it.

The patient, a dentist, age 31, was hurrying down stairs on January 8, 1901, when he fell quite suddenly on his face. On attempting to get up he again fell down. A friend who was present says that the patient was

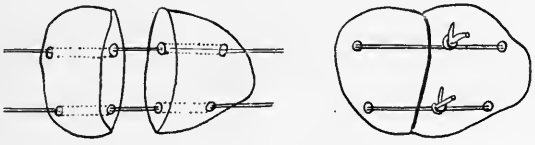

Fig. 12.

descending five steps and thought there was only one, with the result that he fell down the remaining four.

On admission to a private hospital he was found to be an extremely stout ' cobby ' man, with a transverse fracture of both patellæ, and at least one inch of separation between each fragment.

Operation, January 18, 1901.

The fracture, first on one side, and then on the other, was exposed by the reflection of a semilunar flap with the convexity downwards (*Plates I* and *II*). Each patella was found to be fractured straight across, as if divided with a knife. On either side there was a fringe of torn aponeurosis half an inch broad, hanging down from the edge and over the broken face of the upper fragment. The tear in the aponeurosis extended for half an inch on each side from the fracture. The joint contained a considerable quantity of blood-stained synovial fluid.

The aponeurotic curtain was separated from the face of the upper fragment, but was carefully preserved, then the broken bones were restored (*see Fig.* 12) with chromic catgut, and finally the aponeurosis was carefully sutured with interrupted sutures of chromic catgut, repairing the whole tear. The skin wound was entirely closed by catgut sutures, without drainage. An abundant antiseptic wool dressing was applied over gauze wrung out of spirit corrosive solution, 1–1000, which was applied directly

to the wound. The limbs were each secured firmly on two lateral Gooch splints, reaching from the perineum to the sole of the foot internally, and externally from the trochanter major to the same level as that reached by the internal splint.

On February 1, 1901 (thirteen days after operation), the wounds were dressed for the first time, and were found to be healed. Three days later the patient went home.

During the first six weeks after the operation he wore the splints continuously, except when the dressing was done. Thirteen weeks after the operation he was able to flex his knees slightly. Two weeks later he could bend them to a right angle and could ride a bicycle perfectly well. Since then his progress has been uneventful. He has never had any pain or stiffness in his knees (*Plate III*), and is accustomed to stand for the whole day at his dental chair. On several occasions he has walked as far as twenty miles in a day, and says that his legs are in every respect as good as ever they were.

The first point I wish to draw attention to is that of the use of antiseptics in such operations. The ideal asepsis has not yet been realized; so far it has been impossible of attainment, and serious accidents have, I know, occurred in the hands of the best surgeons after operations upon the knee-joint. In contrast, I know of none attributable to the strict followers of Lord Lister's technique, and I believe that these operations are entirely safe if this method is efficiently carried out.

The next point is in reference to the use of absorbable sutures instead of silver wire. I have always regarded the use of unabsorbable ligatures or sutures in the tissues as a violation of surgical principles, and have avoided them if possible.* It is possible in the variety of fracture under consideration, for my cases have shown that the suture method—as adopted in the instance described—has been followed by uniform success.

Finally, as to early movement: there are doubtless advantages in this, but there are drawbacks. Wiring permits of early exercise, but not always with impunity (see *Plate IV A*). With the patella sutured with catgut it would not be safe to allow movement of the knee in less than from four to six weeks. After the splints had been removed, my practice has been to tell the patient to give the knee any exercise he likes, short of causing pain in it, but not to try to hurry recovery. The result has been without exception that in a few weeks the joint was as useful as before, and failure to obtain bony union has never been observed. I have never seen permanent stiffness of the

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* *Lane's work on fractures has proved this view to be wrong, though I still use catgut by preference for the patella.*

PLATE I.

After Operation for Fracture of Both Patellæ.

General Surgery.—Facing page 232

PLATE II.

Showing Line of Incision.

PLATE III.

Showing Complete Recovery eight years after Operation.

A.

B.

B.—Showing Displacement of the Lower Fragment, so that its cartilaginous surface is turned upward and bone union prevented.

PLATE V.

PLATE VI.

PLATE VII.

Right Leg of Patient whose case is described, eight years after Operation.

PLATE VIII.

Left Leg of Patient whose case is described, eight years after Operation.

joint after this operation in any of my cases, though some of the patients were over 60 years of age.

I wish to draw attention to the displacement of the lower fragment of bone. It is so well illustrated by the accompanying skiagrams (*Plates IV B*, and *V* to *VIII*) as to require no description. Obviously the position of the lower fragment, with its broken surface tilted forward and its cartilaginous deep surface opposed to the broken surface of the upper fragment, is a bar to bony union as complete as the aponeurotic curtain. It cannot have escaped observation, though I have seen no note of it.*

In these cases I have always found during operation, as would be expected, that the transverse tear in the aponeurosis was considerable. It appears to me—and this point seems to have been neglected—to be as necessary to repair this as to bring the bony surfaces into apposition.†

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* *This is still insufficiently recognized*

† *It is no longer neglected.*

1910

AN ADDRESS ON SOME POINTS CONCERNING TUBERCLE, SYPHILIS, AND MALIGNANT DISEASE.

DELIVERED BEFORE THE BLYTH DIVISION OF THE BRITISH MEDICAL ASSOCIATION ON SEPTEMBER 25, 1910.

(*The British Medical Journal*, Nov. 19, 1910.)

GENTLEMEN,—I highly appreciate the honour of being asked to address you, and have selected for my subject three of the most common and most interesting of surgical diseases—tubercle, syphilis, and malignant disease. It has been helpful to me, and I trust it may be to you, to consider them together.

For two of them—syphilis and tubercle—the responsible organism has been discovered. It is still being searched for in respect to cancer and sarcoma.

All of these diseases commence locally, and spread mainly by the lymphatics.* The primary lesion in each may either take the form of an ulcer or that of a tumour. Thus, in cancer of the tongue, ulcer is common while tumour is rare; in the breast, ulcer is rare (Paget's disease), while tumour is common.

In tubercle, the primary lesion is frequently so trifling as to pass unobserved.

In syphilis, it may be so insignificant as to attract no attention.

In malignant disease, it is usually a most important feature.

In each, many of the conditions described as characteristic of the disease are the result of septic infection of the primary focus. This may be a serious complication in all of them.

The skin and genito-urinary organs are the favourite sites in all. Syphilis remains localized for so short a time that the generalized manifestations of it have rarely, if ever, been prevented by the earliest excision of the primary lesion. In malignant disease early excision of the primary lesion alone offers a chance. In tubercle it does not often fail.

The importance of the primary focus in all these diseases is not yet sufficiently recognized. If the primary focus in cancer is removed,

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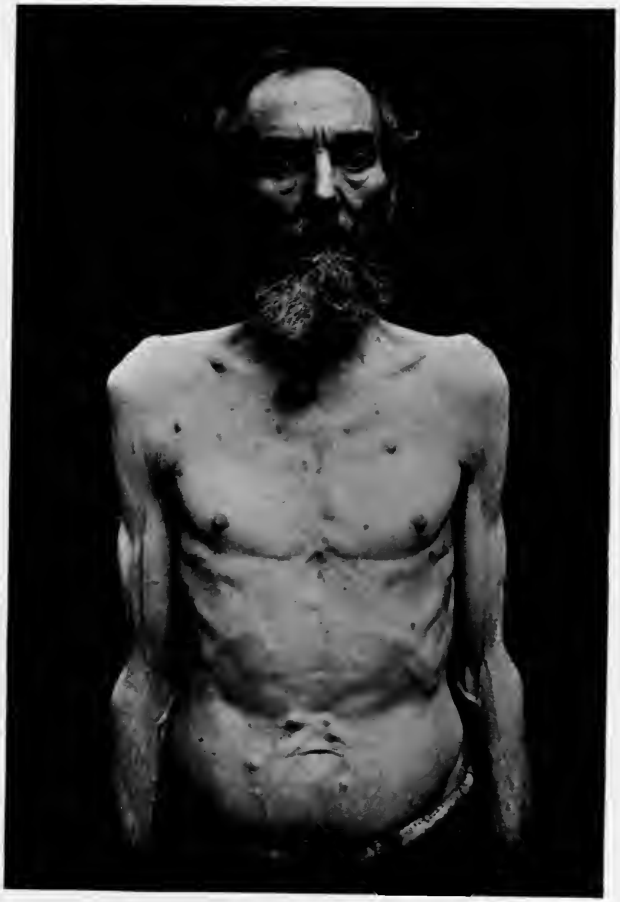
* *They all spread by* (1) *continuity*, (2) *contiguity*, (3) *lymphatics*, (4) *blood*.

PLATE IX.



PATIENT WITH PRIMARY CANCER OF THE PANCREAS AND SECONDARY GROWTHS DOTTED OVER THE BODY IN THE SKIN.

PLATE X.

BACK VIEW OF THE SAME PATIENT AS PLATE IX.

secondary growths will, in a certain percentage of cases, disappear. This has occurred in chorion-epithelioma, when, after hysterectomy, a secondary growth in the lung gave no further trouble. It is also proved by the results of old-fashioned operations for cancer, in which only the primary growth was excised, for it is now accepted knowledge that, in the great majority of these cases, the nearest lymphatic glands are early infected.

Glands.

All of them infect and cause enlargement of the lymphatic glands. These seem to offer little or no resistance to the diffusion of syphilis, considerable resistance to the dissemination of tubercle, and for a long time they stop the advance of malignant disease.

Therefore, syphilis is always disseminated, tubercle frequently, malignant disease rarely.

Syphilis confers complete immunity, tubercle partial immunity, malignant disease probably no immunity at all.

The glandular enlargement in syphilis is general, in tubercle limited, and in malignant disease localized. Following syphilitic infection, all the local glands swell and feel like almonds. Shortly after, all the glands in the body participate. Syphilitic glands never suppurate. Following tuberculous infection, the local lymphatic glands swell one at a time, feel like a string of small potatoes, tend to form large tumours, and frequently suppurate. Following cancerous infection, the local glands enlarge (those nearest the point of infection first), they grow into hard fixed tumours, and seldom suppurate except in the neck.

Dissemination always occurs before three months in syphilis, and on the skin it appears usually as a roseolous eruption. The dissemination of tubercle is rare, and occurs chiefly in the viscera of the head, chest, and abdomen. General dissemination of cancer is rarer still. When it occurs in the skin all over the body, the eruption, on superficial examination, may be mistaken for that of syphilis (see *Plates IX, X*). On the other hand, dissemination of sarcoma is to be expected, and when it attacks the lungs and pleura the symptoms and signs of tuberculous disease are closely simulated.

Ulcers.

It is generally possible to offer a correct diagnosis as to whether an ulcer is due to tubercle, or to cancer, or to syphilis. The age, appearance, and sex of the patient, the history of how the condition commenced, and its site are of an importance next to the physical signs.

Tubercle is most common in the young, syphilis in the middle-aged, and cancer in the old.

Tuberculous subjects look thin and anæmic or fat and pasty (delicate); the syphilitic look 'dry,' with a muddy anæmia, and the cancerous florid and robust.

Tubercle and cancer affect both sexes equally, syphilis mainly the male.

A tuberculous ulcer usually commences as a small sore, which has gradually destroyed its site (destruction in excess of growth); the cancerous ulcer, as an irritable crack around which a tumour has developed (growth in excess of destruction); the syphilitic ulcer, as a tumour which has broken down (an ulcerating tumour).

Tubercle and cancer choose sites furnished with the best vascular supply, syphilis with the worst.

Mistakes will become less frequent with improved diagnosis, but are sometimes, as yet, unavoidable.

I have excised an ulcer of the lower lip, and along with it the enlarged submaxillary and submental glands, of an elderly man, for 'epithelioma.' Microscopical examination of the growth and of the glands proved tubercle.

I excised the tongue of a stout, florid man, between 50 and 60, for an 'epithelioma,' which proved to be tubercle. He was quite well ten years later.

I excised the uterus of a patient for 'carcinoma of the cervix.' This was also a case of tuberculous disease.

To the Infirmary clinics, chancres of the lip or tongue are usually sent as 'epitheliomata.' I treated one girl of 26 and a man of 28 with mercury and iodide, for a 'chancre of the lip.' They both died of cancer of the lip and neck respectively within one year.

I have observed cases of 'cancer of the cervix uteri' cured by a course of iodide and mercury. They were syphilitic sores, and either had, or developed later, signs typical of syphilis.

A large number of 'cancers' of the face have been cured by mercury and iodide; and as large a number of cancers of the tongue and of the penis have had their chance of cure lost through delay in operating whilst the same means were being 'fairly tried.'

Tumours.

The chronic inflammatory swellings produced by tubercle and syphilis have not infrequently been mistaken for malignant disease, and vice versa.

Many bowel 'tumours,' due to tubercle, especially at the cæcum, have been excised under the belief that they were malignant.

I operated on a case of 'cancer of the pylorus,' and found the disease too far advanced for anything but the palliative operation of gastro-enterostomy. To confirm the diagnosis I removed a gland.

It only contained tubercle. The microscopical diagnosis was confirmed by the permanent recovery of the patient and the disappearance of the tumour.

A middle-aged woman had 'cancer of the liver and ascites, with hard lumps in the omentum, and jaundice.' Examination revealed typical tertiary syphilitic ulceration over the left shoulder. Mercury and iodide cured her.

A man, age 38, had three attacks of acute intestinal obstruction in eighteen months. After the last of these I opened his abdomen, and found a 'fixed inoperable malignant growth' in his sigmoid flexure. His doctor, who was present at the operation, mentioned that he had treated him for syphilis seven years before. Since a mercurial course he has had no further attack, and fifteen years after is well. Fortunately I refrained from making a permanent colostomy opening, because I thought it would be soon enough for that when the obstruction recurred.

A middle-aged man had an 'aneurysm of the thoracic aorta eroding his sternum.' The 'aneurysm' disappeared after six weeks of mercury and iodide.

I excised a large thyroid for 'malignant growth' from a woman of middle age. The microscope revealed tubercle.

In another case I made a diagnosis of a malignant thyroid and offered a hopeless prognosis. Six months afterwards an abscess opened and the pus was tuberculous. The patient was alive three years later.

A stout, healthy-looking lady was operated upon by one of my colleagues at my request for a 'typical scirrhus of the breast.' A macroscopic section confirmed the diagnosis. The pathologist and ourselves required more than one series of microscopic sections to satisfy us that we were all wrong. The 'tumour' was tubercle.

A 'tumour' of a bone may be due to either.

I once saw a leg amputated at the hip-joint for 'sarcoma' at the lower end of the femur. This was a syphilitic gumma.

A patient had his leg amputated at the upper part of the thigh for a 'sarcoma' of the lower end. Sixteen months later a 'secondary growth' appeared in the upper end of the humerus of the opposite side. This was cured with iodide and mercury, and the patient is alive and well fifteen years later.

A patient was advised amputation at the hip for a 'sarcoma' of the upper end of the femur. The advice was not accepted. Twelve months later a tuberculous abscess was opened, and recovery followed.

A patient was operated on for 'tubercle' of the upper end of the humerus. Profuse hæmorrhage followed the incision, and a fungating malignant growth appeared through it a few days later.

Even a skilled pathologist with his microscope may make mistakes.

A man of 35 had his right testicle removed for a 'round-celled sarcoma.' Nine months later he 'developed a secondary growth in his brain.' This serious brain lesion disappeared after a course of mercury and iodide. Nearly twenty years later he is well.

I was once asked to look down a microscope and offer a diagnosis. I felt no doubt that the section of skin revealed bore a typical epithelioma. It was a nodule of leprosy, and a favourite 'catch.'

A young married man had his left testicle excised for 'tubercle.' The diagnosis was confirmed by the microscope (no tubercle bacilli were found). One year later his right testicle swelled as the other had done, and he resented the proposal that it also should be removed. Mercury and iodide quickly cured him.

Hodgkin's Disease (*Lymphadenoma*).

This condition, as yet ill understood, sometimes resembles tubercle, sometimes sarcoma, in its clinical course.* The enlarged glands, which are characteristic of it, may remain for long unchanged, then slowly soften, redden on the surface, break down, discharge a curdy matter, and finally heal. The patient with this form of the disease may live for several years. In the second type the glands become glued together and fixed; internal growths develop quickly, and the patient dies, with dissemination throughout the viscera.

Fibrosis.

Natural cure occurs in all of these diseases. It is the rule in syphilis, the exception in tubercle, and very rare in cancer. In all of them the cure of the local lesions is the result of fibrosis.

The tendency to break down is characteristic of the acute type of tubercle, syphilis, and malignant disease; and to fibrose is characteristic of the chronic variety.

The natural tendency of fibrous tissue to contraction accounts for the fact that stricture of the tubular viscera may be the result of tubercle, of syphilis, or of cancer.

In all, the newly developed fibrous tissue may grow so luxuriantly as to form a tumour, chiefly fibromatous. Keloid of the skin, and many internal growths, are of this nature, and in each of them the chief clinical characteristics are slow development and long duration, with periods of quiescence (fibrosis or sclerosis in excess) and exacerbation (infection in excess).

In the prognosis of cases of cancer everything depends upon the amount of existing fibrosis. The ill-defined diffuse growths, so active

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* *The etiology and pathology are no nearer a settlement yet.*

as to simulate inflammatory swellings, offer the worst prognosis. The firmer, more defined growths, resembling simple tumours in their physical characteristics, are the most favourable in prognosis.

A growth rich in cells and without much fibrous tissue will rapidly disseminate and kill.*

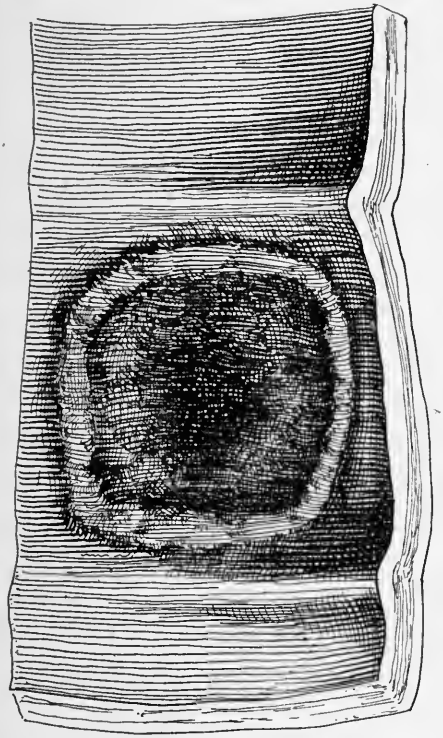


Fig. 13.—Large Ulcerating Carcinoma of Large Intestine.
Malignant variety, with little obstruction and little fibrosis.

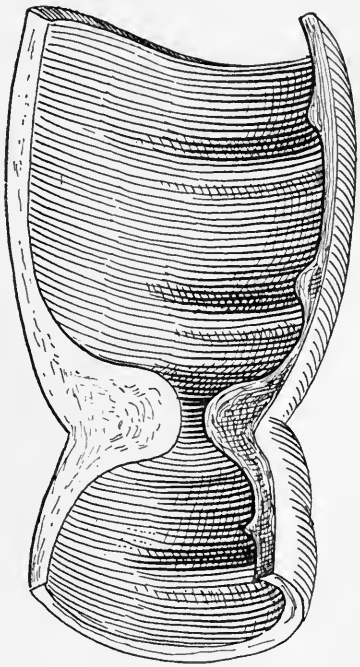
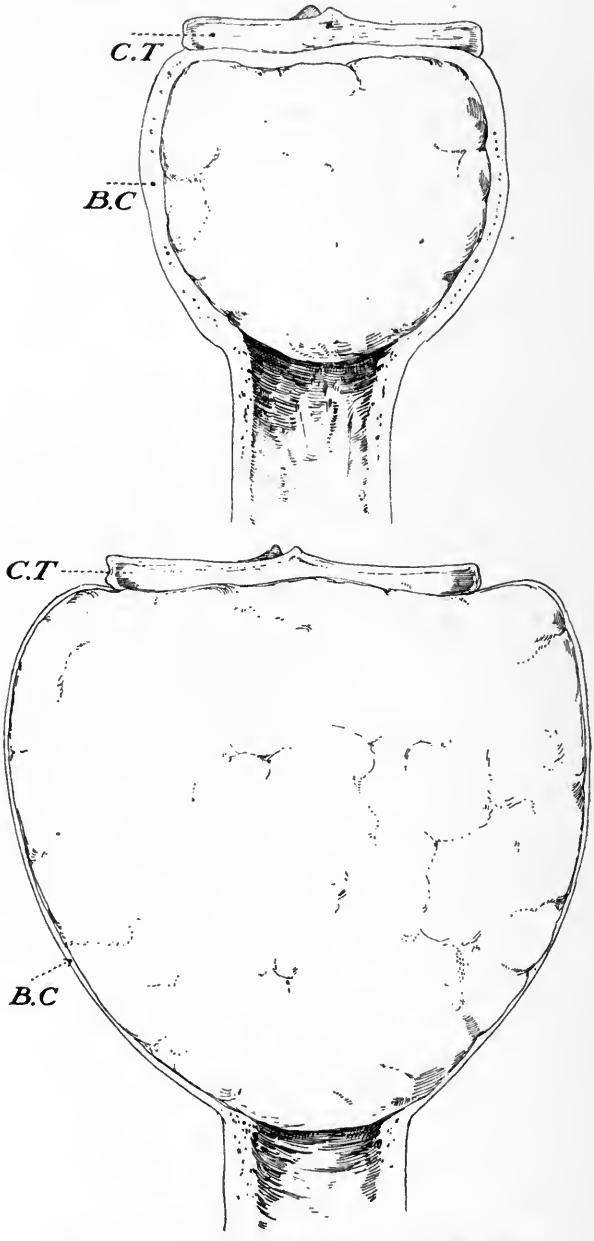


Fig. 14.—Constricting Carcinoma of Large Intestine.
Chief signs, intestinal obstruction and marked fibrosis.

I have known a patient die of breast cancer within three months of its appearance. On the other hand, one patient under my care lived for twenty-five years after two operations for breast cancer, both of which failed to remove the growth and were followed by an inoperable recurrence. Death resulted from extension of the cancer to the

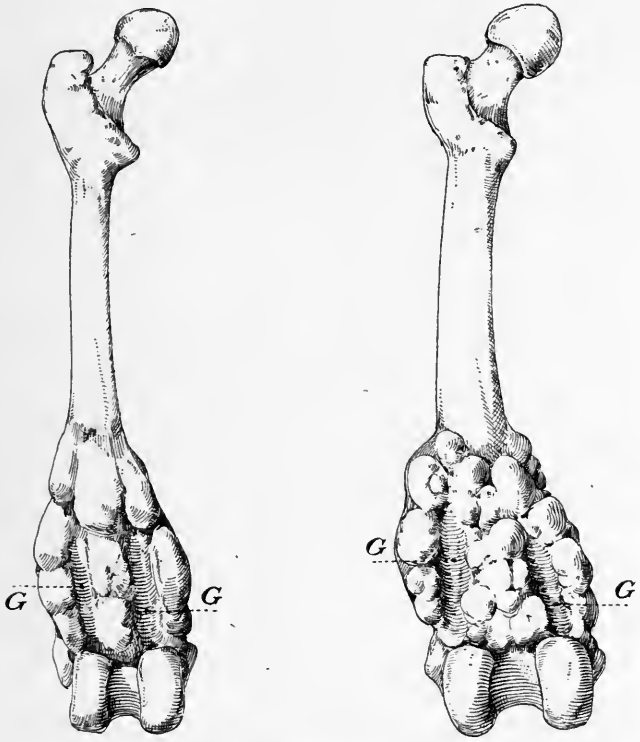
* *Paul, of Liverpool, has drawn attention to the most important clinical fact that a fungating growth which develops towards the surface either of skin or mucous membrane is least likely to recur after operation. This is certain. My conclusion applies to an* INFILTRATING *type of growth.*



Figs. 15, 16.—Illustrating the Growth of Bone Tumour.
(*C.T*) Cartilage of head of tibia. (*B.C*) Bony Capsule. Note thickness when the tumour is small, becoming thinner as it grows.

pleura and lung. From time to time I had the opportunity of watching the great fight between cancer and fibrosis, and though complete healing never occurred, the supremacy of the external fibrous tissue was maintained till the end. This was at the expense of much discomfort to the patient, for the right side of her chest was tightly bound and contracted by thick, large patches of scar tissue.

Many cases of atrophic scirrhus cancer of the breast have lived for years without much discomfort, and have frequently in the end



Figs. 17, 18.—" PERIOSTEAL " SARCOMA.
Note—(*G.G.*) Grooves for hamstring.

died through bone infection. They owe their benign course to fibrous-tissue formation. Some of them assume a more malignant course after operation, and in view of what has been said the explanation is obvious.

Cancer of the colon may be one of the most malignant or one of the most benign of malignant growths.

If it takes the form of a tumourating ulcer without stricture its course is malignant (*Fig.* 13); if, on the other hand, stricture (that

is, fibrosis) is the predominating feature, a better prognosis can be offered (*Fig.* 14).*

Tuberculous glandular tumours of long standing are chiefly composed of fibrous tissue.

A patient of mine carried about a testicle the size of a cocoanut for twenty years, before it troubled him sufficiently to require removal. It was syphilitic, but consisted chiefly of fibrous tissue.

Bones.

For bone sarcomata the rule corresponds exactly with that discussed above. Their malignancy may be gauged by the amount of osseous tissue in relation to them.

The least malignant (myelomata) (*Figs.* 15, 16) have an even, rounded shape, and may not destroy life for many years. They are enveloped in a well-defined bony capsule, which may expand indefinitely with their growth. If they burst through this capsule they infiltrate the surrounding tissues, grow rapidly, and declare their malignancy.

The most malignant of malignant tumours are the so-called periosteal sarcomata of growing bones. They spring from the bone, and their favourite site is in the neighbourhood of the most active epiphyses (upper end of humerus, lower end of radius, lower end of femur, upper end of tibia). Their growth is so rapid that they assume an irregular lobulated form, and any resistant structure met with, such as tendon, blood-vessel, or nerve, leaves its mark on their surface, because, in their hurry to get big, they follow the path of least resistance (*Figs.* 17, 18). Their victims die within the year, usually from growths in the lung, whether the most radical operation is or is not done.

In the intermediate group of bone sarcomata—those of neither very slow nor very rapid growth—the degree of malignancy may be estimated by the amount and density (shown by x rays) of the osseous tissue connected with them (see *Plate XI*). Some, after years of slow growth, suddenly develop their malignant tendency, owing to the fact that the tumour cells have overpowered their osseous inhibitor.

Like the pyogenic infections, those of tubercle, cancer, and syphilis can be imprisoned by fibrous tissue and bony deposits for long periods of time.†

Septic Infection.

The evil influence of septic infection on tubercle, malignant disease, and syphilis is insufficiently recognized. Each may have a

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* *See footnote on p.* 239.

† *This truth is now receiving more recognition.*

PLATE XI.

"PERIOSTEAL" SARCOMA.
Upper end of Humerus. Note ossification.

PLATE XII.

MIXED SYPHILITIC AND TUBERCULOUS DESTRUCTION OF FACE.

relatively benign course till sepsis is superadded. An uncomplicated tubercuIous abscess never causes constitutional disturbance or death; when septic infection has gained entrance to it, both frequently follow.

The uncomplicated primary 'sore' of syphilis is not a sore at all, but a hard, dry, raised, painless lump.

Most of the pain, the odour, and the discharge of cancer are due to superadded sepsis. One of the conditions in which they are all pronounced is cancer of the uterine cervix. I have had opportunities for observing elderly spinsters with this disease. In all, the only early symptom was hæmorrhage. Before the growth had caused serious disturbance it had in each instance invaded the bladder, was infiltrating the surrounding structures, and had become inoperable.

Chronic Lymphatic Œdema.

Amongst other causes of chronic lymphatic œdema of the extremities, tubercle, syphilis, and cancer have to be remembered.

Combinations.

That of syphilis and tubercle is a deadly combination. I have seen cases in which tubercle attacked the lungs of a victim of secondary syphilis. In each instance the tubercle rapidly advanced to a fatal issue.

The most disastrous form of 'scrofula' is a combination of congenital syphilis and tubercle (see *Plate XII*).

Cancer and syphilis are very firm allies, and syphilis often provides a suitable site for the lodgement of cancer.* If a person over 60 years of age contracts syphilis, his death from cancer may be anticipated.

Tubercle and cancer favour the same sort of soil. Persons who have recovered from tubercle in their youth are exceptionally liable to cancer in their later years. It is more than a coincidence that both occur in families with a history of some members having attained to an extraordinarily long life.

CASE OF ACCESSORY THYROID TUMOUR.

(*Northumberland and Durham Medical Society; Reported in Journal*, 1910, pp. 16, 26.)

The patient, a woman, age 57, the subject of this note, came under the care of Mr. Rutherford Morison, in the Royal Victoria Infirmary, on November 13, 1909. She gave the following history: For the greater part

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* *e.g. Tongue cancer is rare without previous syphilis.*

of her life she remembers having a small swelling, the size of a marble situated in the upper part of the right side of her neck. It was movable, and did not cause her any trouble. It grew quite slowly until four years ago, when it began to increase in size more rapidly. Even up to the present time, except for slight dyspnœa on lying on the right side, she has suffered no inconvenience from the tumour.

On examination, the tumour, about the size of a duck egg, for the greater part occupied the right submaxillary region, reaching as far back as the lower extremity of the parotid gland, and below it extended over the hyoid bone to the upper border of the right lobe of the thyroid gland. It was freely movable over the underlying structures, and the skin above it could be easily lifted up from the tumour. Although in close apposition to the lower jaw, it could be lifted away from it.

It fluctuated, and its surface felt dimpled, not unlike thyroid tissue.

A definite diagnosis was not made, but the swelling was thought to be in connection with the parotid gland. On November 14, 1908, she was operated upon. A large soft mass, highly vascular, and in every way resembling thyroid tissue, was removed. It lay quite superficial, being directly under the platysma muscle, and communicated with the thyroid gland through a small hole in the deep cervical fascia. Its only attachment was to the upper right lobe of the thyroid gland, with a broad pedicle about one inch in breadth. The vessels in the pedicle were ligatured and the tumour was removed. On external examination the tumour looked very much like a lobe of the thyroid gland. On cut section, its surface was smooth, deep red in colour, and near the centre showed areas of fibrous tissue, and at one end a portion had undergone calcareous degeneration.

The tumour contained no cysts or hæmorrhages. On microscopical examination it showed connective tissue enclosing numerous rounded vesicles lined by large cubical epithelial cells. The vesicles contained colloid, and in every way the structure resembled that of normal thyroid tissue.

BONE DISEASES RESULTING FROM INFLAMMATION.

A Post-graduate Demonstration.

(*Northumberland and Durham Medical Journal*, June, 1910.)

Experience has convinced me that the chief practical difficulty in regard to a right understanding of the processes of inflammatory bone disease lies in the fact that these processes are often regarded as having a pathology peculiar to themselves. Osteitis is far too often suspected of being a different process from that which occurs when the soft parts of the body are similarly affected by inflammation. With such a tendency to confusion of thought it is no wonder that bone diseases should often, though quite unnecessarily, present features of exceptional obscurity.

I want therefore to state as emphatically as I can that there is one process of inflammation for the soft and hard parts of the body alike. Wherever inflammation occurs it is traceable to a like cause, runs a similar course, modified only by simple mechanical consider-

ations, and proceeds by common rule to one or other of several identical results. To understand the pathology of inflammation in general is to understand that of bone inflammation in particular, and the overwhelming majority of bone diseases result from this.

To rightly appreciate the subject, a few anatomical facts are to be borne in mind at the outset. The flat bones are mostly formed of compact tissue, the short bones of spongy tissue, and the long bones of a more equal combination of compact and spongy constituents, the shaft or diaphysis being chiefly compact, the extremities or epiphyses, which are separated in the growing bone from the shaft by a cartilaginous disc, chiefly spongy. The shaft is hollow, containing the medulla or marrow. The nutrient arteries enter the bone through the investing periosteum, and, excepting the chief nutrient artery itself, chiefly in the neighbourhood of the epiphyses. The anastomosis is by way of the Haversian canals.*

Etiology.—The etiology of inflammation in the hard and soft parts is precisely the same. Acute osteitis,† including periostitis, epiphysitis, and osteomyelitis—which be it remembered never exist independently of each other, but always in conjunction, and which except from an anatomical standpoint have no claim to a special nomenclature—is due to the activity of the well-known organisms of acute infection. The staphylococcus and streptococcus pyogenes are mainly responsible, but the staphylococcus albus, bacillus coli, pneumococcus, typhoid bacilli, and others may also occasionally be found to be the cause.

They find an entrance :—

1. At a point where injury is received, as in cases of compound fracture.

2. From spread of surrounding inflammation ; for instance, after a scalp wound.

3. Through hæmatogenous infection, either by way of the mucous membranes or skin.

Probably in the majority of cases the organisms effect an entrance from the alimentary canal.

Chronic inflammation is almost invariably traceable to the micro-organisms of tubercle or syphilis.

Acute Osteitis.—The symptoms of acute osteitis are those of acute inflammation in general.‡ They are pain, swelling, heat, redness, and impairment of function. The pain is due to tension, and owing

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* *The metaphysis.*

† *Acute infective osteitis is the best name for the whole group.*

‡ 1. *General = Fever.* 2. *Local = Pain, including tenderness, etc.*

to the unyielding character of the structure involved is exceptionally severe. Pain and tenderness may be differentiated in the early stage from the pain and tenderness of acute articular rheumatism by the fact that the point of maximum intensity is over the epiphysial region and not over the joint. The epiphysial region is specially liable to infection owing to its abundant and complicated blood-supply.

Pain varies, however, from the well-known 'growing pains' at one end of the scale to the agonizing suffering which soon reduces the patient to a state of collapse.

The general results may be no more serious than those of growing pains; they may, on the other hand, imply toxæmia and death in a few days.

As in other cases of inflammation, an abscess usually forms and bursts. The resulting sinus leads to hard, dead bone. This 'sequestrum' loosens in about six weeks, and is to be found lying in a bed of granulations, the growth and presence of which tend to effect its extrusion by way of the sinus. The removal of the sequestrum may, however, prove a matter of considerable difficulty owing to the invaginating growth of the 'involucrum' or new bone derived from the surrounding periosteum. Heat, swelling, and redness are, from obvious anatomical considerations, observable in the soft parts surrounding the bone, and are due to inflammatory extension from the primarily inflamed area. They are thus further evidences of the one common inflammatory process at work.

Prognosis.—The immediate dangers are those of septicæmia and pyæmia. There is also the grave risk of the involvement of joints by direct infection. Later the risks are those of prolonged suppuration. Hectic fever and lardaceous disease are to be specially remembered in this connection. Also arrest of bone growth, a danger easily understood if we bear in mind the special liability of the epiphysial region to pyogenic infection, to which reference has already been made. Or excessive bone growth may occasion deformity, with at the same time more or less continued impairment of function. When two bones are in proximity the deformity of one may bring about serious results.

Osteitis may terminate in resolution, sclerosis, partial destruction (caries), or total destruction (necrosis).

Sclerosis of bone corresponds with the fibrosis of soft structures; caries with ulceration; necrosis with gangrene.

Treatment.—I have known the early application of Bier's elastic bandage, which aims at producing venous congestion of the affected region, arrest an acute osteitis of the femur. At the earliest stage of inflammation Bier's method is well worthy of trial. If this fails, the bone should at once be freely opened with the trephine or chisel to relieve

tension,* but no scraping or extensive operation beyond that required for a free exposure of infected medulla should be done at this stage.

If a joint is affected, amputation may be necessary, and will be if the joint is a large one, such as the knee.

Sequestra are to be removed when sufficiently loosened, that is to say in not less than six weeks. The time for this and the operation to be performed must be suggested by the experience of the surgeon.

Chronic Inflammation.—Putting aside the curiosities of surgery, chronic inflammation is always due to one of two forms of infection, tubercle and syphilis, and it is to be remembered that tubercle is very much the commoner. So much so is this the case that the term chronic osteitis, if unaccompanied by any further qualifying adjective, is practically taken to mean tuberculous osteitis. The spongy bones are its seat of election, as for instance the vertebræ and the tarsal and carpal bones. Where the long bones are attacked, their spongy portions are affected, in other words the regions of the epiphyses. The medulla is also very shortly infected when the disease commences on the diaphysial side of the epiphysial cartilages.†

As we have observed, acute inflammation of bone tends by total arrest of the circulation to necrosis or molar death, corresponding with gangrene of the soft parts; chronic inflammation to caries or molecular destruction by partial arrest of the circulation, as in ulceration. In the one case the process is rapid and intense, in the other slow, mild by comparison, but continued. Hence the resulting death and decay are gradual. Caries is, in fact, due to a gradual failure of the circulatory requirements brought about by the pressure of inflammatory deposits round the blood-vessels. The action of toxins in the affected area may assist the process of destruction, but this has not been definitely proved, and at the least caries is to be regarded as mainly a result of local anæmia.

When caries affects the epiphysial region of a long bone, the process may extend into the contiguous joint.

Pathology.—The cancellous spaces are choked with granulations. These in turn undergo caseous degeneration and may break down to form a 'cold abscess.'‡ This abscess bursts externally, leaving a sinus

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* *In the acute case, if life is to be saved—in every instance if the bone is,—a free opening must be made without delay.*

† *Stiles's researches have shown that this is the usual place of origin.*

‡ *To impress upon students the pathology of tubercle tell them that a cure at any stage may result in fibrosis; that when caseation has occurred the cheese may become chalk (natural cure), or it may soften (butter), still further soften (cream), and finally become a 'cold abscess' (curds and whey).*

which leads to carious bone. The symptoms meanwhile have probably been extremely mild. I remember a practitioner walking into my consulting-room and complaining of a lump in the groin which he had observed for a few days and which was increasing in size and annoying him by bulging into his trousers pocket. There had been a little aching pain, a little sense of stiffness, and slight tenderness in the dorsal region. Otherwise he had felt well. The lump was a psoas abscess containing 1½ pints of pus, and when it was opened the communicating abscess was found to lead away to carious vertebræ.

It is when the abscess bursts or is opened without strict precautions that trouble is likely to begin and immediate danger threatens. The risks of sepsis are very great, and sepsis in these cases works havoc. The super-imposition of an acute inflammatory process upon a region already in the grip of a specific invader, whether tubercle or syphilis, is a most grave complication.

Symptoms.—During the early stages the progress of tuberculous osteitis is slow and generally almost painless. The bone enlarges and the periosteum thickens. Then a doughy swelling becomes more and more noticeable, softens, reddens, presents the characteristic features of abscess, and finally bursts, leaving a sinus which leads to the affected bone.

Prognosis is serious and practically hopeless in the case of elderly people. In children under 10 years of age, healing under proper treatment will always occur. After 50 years of age I have never known a case to recover. Abscess formation adds to the gravity of the outlook, and sepsis does so still more.

The situation of the affected bone bears closely on the question of prognosis. Accessibility or inaccessibility are the determinants which render effective treatment possible or impossible. Then we have to remember that anatomical environment accounts for most of the special risks. Vertebral disease menaces the cord and its membranes. Petrous inflammation threatens the brain, meninges, and their great venous channels, as also the sense organs of hearing and equilibration. A tuberculous rib is a source of grave danger to the underlying pleura and lung. Epiphysial inflammation jeopardizes the safety of a neighbouring joint, and may affect the development of the affected bone in young subjects.

Treatment must be both general and local. Rest in each of these senses is the first essential. The resistive powers of the body and its tissues are at the same time to be encouraged and augmented by every means available. An open-air treatment adapted to the special needs of each case is based on this principle, and acts as the most powerful stimulant and tonic at our disposal. Careful, nutritious feeding is essential, for anæmia, whether general or local, is most

prejudicial. I have already referred to the occasional value of Bier's elastic bandaging, which substitutes for a local anæmia a condition of passive hyperæmia.

The inflammatory focus should be removed if possible, and in any case all the tuberculous tissue which can be reached. In youthful cases Nature can deal with a certain amount of tuberculous tissue unaided, but our aim is to lighten her task as far as possible. Tuberculous tissue may be scraped out or excised, or it may be destroyed with carbolic acid or chloride of zinc, which also disinfect beyond the zone of their destructive action. I am doubtful as to the advisability of excision of the whole affected bone. Iodoform is employed as a means of assisting chemiotaxis by stimulating the defensive leucocytes to increased action. It is most safely and most often applied by the method of gauze packing.

Bismuth-vaseline injections, worked in as far as possible along the sinuses, are of value from the diagnostic point of view, as they mark out the track of a sinus when viewed by the Röntgen rays. The injection has also a remedial action of its own which adds still further to its usefulness. Amputation of an affected limb is always to be recommended when a patient is over 50 years old, for it then offers the only prospect of recovery. With younger patients, amputation should be resorted to when septic tuberculous disease is interfering with the healing of otherwise curable visceral lesions. (Röntgen-ray photographs were exhibited along with patients to demonstrate tuberculous foci in bones and to show their use in the treatment of them.)

Syphilis.—Bone lesions occur in secondary, tertiary, and inherited syphilis. Periosteal nodes are characteristic of the secondary form, while gummatous osteitis is the special feature of tertiary syphilitic bone disease. Chronic diaphysitis should excite a suspicion of syphilis. In inherited syphilis an osteitis near the epiphysial line in infants resembles rickets, and has led to many mistakes in diagnosis. The pseudo-paralysis which constitutes so characteristic a feature may also lead to mistakes in diagnosis.

In adolescence, when both tibiæ are simultaneously affected by osteitis, the presumption is in favour of a syphilitic explanation.

(A patient was shown to illustrate the aphorism: "*There is no such thing as an acute cellulitis in children apart from septic osteitis.*")

(Röntgen-ray photographs of sequestra and other diseases of bone, and specimens and patients, were shown to illustrate the paper.)

A NOTE ON THE EMPLOYMENT OF MOUTH GAUZES AND MOUTH WASHES IN OPERATIONS.

By Hamilton Drummond, M.B., B.S., Surgical Registrar to Royal Infirmary, Newcastle-on-Tyne.

(*Northumberland and Durham Medical Journal*, 1910, p. 149.)

After several experiments carried out by speaking into and blowing upon Petri dishes with agar-agar, the decision was arrived at that it was impossible to get anything like accurate results without standardizing all solutions.

In order to ascertain to what extent the mouth gauzes prevent organisms passing through them and to prevent doubt arising as to the origin of the colonies, a solution of prodigiosus emulsion was used as a mouth wash, which bacillus produces a red growth when grown at a temperature of 20° C.

There were 24 experiments (see Table below), and in each case the mouth was washed out with a solution of emulsion (10 c.c.) for half a minute, and after every third experiment the mouth was well rinsed with distilled water.

The gauzes employed were simply a double layer of closely-sewn material, such as is used by Mr. Lane in Guy's Hospital and Great Ormond Street. A fresh gauze mask was used for each experiment, and the time allowed for rinsing the mouth with carbolic, 1-80, was ten seconds.

The Petri dishes containing agar-agar were held at a distance of one foot from the mouth, and were quietly spoken into or blown upon for one minute for each experiment.

For the permission to record this note I have to thank Professor Rutherford Morison, for whom the experiment was performed, and Professor Hutchens, in whose laboratory the work was done, for his help and suggestions.

	No. of experiment.	No. of colonies on each plate.	Aggregate No. of colonies in each series.
Series I.—Without mouth gauze or carbolic mouth wash.			
Blowing	1	3	
	2	1	
	3	0	
			14
Talking	4	3	
	5	1	
	6	6	
Series II.—Mouth gauze.			
Blowing	7	1	
	8	0	
	9	0	
			2
Talking	10	1	
	11	0	
	12	0	

	No. of experiment.	No. of colonies on each plate.	Aggregate No. of colonies in each series.
SERIES III.—Mouth gauze and carbolic mouth wash.			
Blowing	13	1	2
	14	0	
	15	1	
Talking	16	0	
	17	0	
	18	0	
SERIES IV.—Carbolic mouth wash.			
Blowing	19	2	17
	20	0	
	21	0	
Talking	22	1	
	23	9	
	24	5	

PATHOLOGICAL SPECIMENS.

(*Northumberland and Durham Medical Society: Report in Journal*, 1910, p. 195.)

Shown by Mr. Morison—

RECURRENT MALIGNANT THYROID TUMOUR.

Removed by operation from female, age 59. Showing friable growth.

History.—First operation June 1, 1907. Recurrence appeared twelve months ago; no other symptoms or signs.

Micro. Report No. S/2149.—Endothelioma.

Remarks.—At the operation it was found to infiltrate the sterno-mastoid muscle, etc.

THYROID (LATERAL LOBE).

Removed by operation from female, age 28. Showing uniform enlargement; on section it was fleshy.

History.—Attacks of palpitation for nine years; for two years had swelling, exophthalmos, and nervous symptoms; perspired, some emaciation, diarrhœa, some skin pigmentation. Father similarly affected as young man.

Micro. Report No. 5101.—Exophthalmic goitre.

Remarks.—Uninterrupted recovery.

SCIRRHUS OF BREAST.

Removed from female. Showing scirrhus type, with nodules in the skin and on the sheath of the pectoralis major muscles.

History.—Six months ago she noticed a nodule in the upper part of

the breast, and three months later several nodules came in the skin, and the whole breast became red and œdematous.*

Micro. Report.—Spheroidal-celled carcinoma.

Remarks—Patient now (three months after operation) has advanced recurrence ; skin nodules are seen over the chest and back.

EMPYEMA.

(*Medical Annual*, 1910.)

The recognition and proper treatment of empyema is of the greatest practical importance, because it is a relatively common disease, and if not satisfactorily dealt with, a very fatal one. Children are its chief victims ; in at least nine out of ten cases it follows pneumonia, and it is curable by a very simple operation. If, after an attack of pneumonia, convalescence is not straightforward, the first suspicion aroused should concern empyema. The physical signs which have been thought to indicate pneumonia do not clear up in the ordinary way, the temperature assumes the pus type—high in the evening, low in the morning. Sweating about the head occurs at night, and the patient has the grey, pallid complexion of chronic toxæmia. Under such conditions no time should be lost in exploring the chest. The exploration can be well done with a good hypodermic syringe in the 7th intercostal space behind the mid-axillary line. Needless to say, this and subsequent proceedings should be done with all surgical care, for the result depends, more than anything else, on the avoidance of further infection of the pleura. If pus is found by the needle, the sooner operation is performed the better.

The operation should be done under a general anæsthetic : chloroform until the patient is unconscious, then open ether till the end. The patient, lying on his back, is drawn to the edge of the table, so that the diseased side projects as a convexity beyond the edge of the table. This opens up the intercostal spaces. The operator kneels or sits on a low stool in such a position as to have access to the side partly from below. After the hypodermic needle has shown again the presence of pus, the syringe is unscrewed, leaving the needle as a guide. A *vertical* incision is then made, with its centre level with the puncture and by the side of the needle, about $1\frac{1}{2}$ in. long. The vertical incision obviates kinking of the tube, which is likely to follow the usual oblique incision. When the muscles are exposed, the needle is withdrawn to avoid breaking it into the chest, and a director is

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* *This is an example of the vicious malignancy of cancers which resemble inflammatory swellings.*

driven into the pleura at the same spot. Along the groove in the director a pair of closed strong sinus forceps is pushed, and withdrawn open, *transversely*, care being taken to maintain the director in position. Through the hole so produced in the intercostal space, 2 in. of drainage tube, with a safety pin to prevent the tube from slipping in the outer end, is guided by forceps into the pleura along the groove in the director, and the operation is complete. No washing out or other interference is necessary or desirable; indeed, this simple operation gives better results than any other. The discharge ceases at the end of a few days if the dressing is frequently changed and antiseptic precautions have been adopted throughout, for these are essential to success. As soon as the pleura discharges no more pus, usually in a week, the drainage tube should be removed; and now, unless special precautions are taken, disappointment may follow. After a few days of normal temperature, an evening rise means re-accumulation of pus from too early closure of the opening. This is to be avoided by passing a director into the opening daily, after removal of the tube, to ensure its patency, and so long as there is any discharge this should be continued. If the chest has not healed in three weeks, something has gone wrong, and a further operation is probably necessary. Old empyemata may be cured by operation or operations, but they demand courage and patience from both surgeon and patient, and neither can count on a certain reward.

SURGERY OF THORAX.

(*Medical Annual*, 1910.)

Surgery of the thorax is advancing, and recent additions are the result of animal experimentation. The law in England being inimical to this essential, British surgeons have to wait and learn from those not hampered by the same restrictions. Apart from ordinary surgical difficulties, the thorax offers three special problems for solution. The first concerns diagnosis. It is impossible or difficult, on account of the rigid walls and the inaccessibility of its contents, to make use of the two most important aids to diagnosis, inspection and palpation. Consequently the detailed diagnosis necessary for successful surgical procedures is not infrequently unavailable. The second difficulty arises from the fact that an opening made through the chest wall, unless adhesions prevent it, is followed by collapse of the lung and pneumothorax. The third refers to the healing of the wound, which may be made exceptionally difficult from the rigid chest walls.

The first difficulty, that of diagnosis, can be surmounted by the

possibility of complete examination, and this could only be accomplished after an opening had been made in the thorax sufficiently large to allow of inspection and palpation of its contents. The danger attending exploratory incision has up to the present time prevented this advance. But this danger is passing away, because experiments have proved that by means of apparatus it is possible to prevent collapse of the lung when the thorax is opened. This has been accomplished by two methods : the first for securing negative pressure, of which the Sauerbruch negative pressure-chamber is the type, and the second for producing positive pressure by administering compressed air through a special mask. For the third difficulty, till some plan of filling up the cavity with sponge-graft, or other substance unlikely to cause disturbance in the pleura, has been evolved, it will be needful to continue the rough means that have been long in use for the cure of chronic empyemata.

For difficult and prolonged operations in the thorax, the use of these methods is essential to success, but I have proved that exploration and the more simple operations, such as excision of the lung, can be done without them. More than once I have opened the thorax so freely as to allow of complete inspection and palpation of the lung, and the patients have recovered without undue trouble.

1911

DISEASES OF THE BREAST.

READ AT THE DECEMBER (1910) MEETING OF THE NORTHUMBERLAND AND DURHAM MEDICAL SOCIETY.

(*Medical Press and Circular*, March, 1911.)

A large and important book, the work of two American authors, Drs. Kelly and Noble, bears the title of " Gynæcology and Abdominal Surgery." Mark the sequence—gynæcology first. The authors are specialists in that branch.

In this book there is an excellent chapter on Diseases of the Breast, and the obvious deduction is, that since these diseases cannot pertain to the domain of abdominal surgery, they must in consequence belong to that of gynæcology, which in a sense is true enough.

I am going, however, to ask you to take an even more imperial view of the situation, since the breast of the male is subject to exactly the same diseases as that of the female, and because many other glandular organs of the body, if not all of them, respond almost, if not quite as readily, to sexual stimuli in both male and female alike. Salivation, pigmentation, changes in the thyroid, and in the secretory activity of the kidneys, are well-known physiological results of such stimulation, and occasionally the disturbance of the organs affected becomes so pronounced as to lead to pathological conditions.

At the age of puberty the same changes may occur in the breasts of either male or female, and although, in the case of the male, it is usual for any enlargement to disappear, there are a sufficient number of cases recorded in which a male has developed breasts equalling in size and quality those of the female to prove that an ovarian stimulus is not of necessity the only, or even an essential, requirement for development of the breast.

That this development may bear a relation to other stimuli than ovarian or testicular is also suggested by the fact that malignant growths of the adrenals are not infrequently associated with precocious sexual development. To such an extraordinary degree may this take place that one little girl, age 6, who was so afflicted and under my care, possessed the mammary and sexual organs of an ordinary maiden of 16. That this development is largely influenced by the new growth

is proved by the fact of the mammary growth disappearing along with the other changes when the new growth is excised.

The condition of certain other glands is known to influence the breast—e.g., its atrophy is caused by diseases of the thyroid and of the pituitary body. Some diseases of the pancreas (cirrhosis) are associated with infantilism and arrest of breast development; so is diabetes, and this is often of pancreatic origin. Active changes in the parotid (mumps) may be accompanied or followed by similar changes in the breast. And both breasts and parotids may swell and become painful during menstruation.

The first point I wish to suggest for your consideration is that all of the secretory glands of the body are more or less depending upon each other, and that their activities are influenced by a mutual bond.

In cases of diseases or abnormalities of the breast, a belief such as this will lead to inquiry as to the condition of the ovaries, the thyroid and pituitary, the salivary glands, the pancreas and liver, the adrenals and kidneys, and the prostate.

In considering the pathology of the breast, it has been helpful to me to think of it in connection with that of all the glandular organs mentioned, and what information we have concerning these suggests that similar changes can be found in all of them, if carefully enough searched for.

Cysts, single and multiple, without or with fibrosis, serous and papillomatous, associated with adenoma, with sarcoma, and with carcinoma, dermoid and hydatid, have been reported in each of them. Solid tumours, adenoma and fibro-adenoma, fibroma, other connective-tissue tumours, mixed tumours, papillomata, sarcoma, and carcinoma, occur in the breasts, the ovaries, the testes, the thyroid, the salivary glands, the pancreas, the liver, the adrenals and kidneys, and the prostate.

The second point I wish to suggest for your consideration is that, with unessential modifications, the pathology of all the glandular organs is the same.

The time at my disposal to-night does not allow of more than a reference to these interesting relations, but I would like to refer briefly to two diseases of the breast which have specially interested me, and to offer in conclusion some practical aphorisms.

The first of these breast diseases is called interstitial mastitis, and the second has now been made known to me by Professor Macdonald as 'intracanalicular fibroma,' or myxoma, though for some years I had recognized its clinical characteristics.

Chronic Interstitial Mastitis.—Pathologists, and even surgeons, sometimes are pleased and made content by a long and imposing name, and this one has served for a long time to cover a multitude of sins of

omission and commission in regard to the breast. If, for instance, the surgeon has excised a breast for 'cancer,' and the pathologist has reported 'only interstitial mastitis,' the surgical conscience has been relieved by a belief that this is one of the most frequent precursors of cancer, and that the breast is best away. If a swelling, pronounced to be simple, and for long treated as such, develops the signs of malignancy, "it must have been an interstitial mastitis which has turned to cancer," and I think it possible that there is some truth in both views. All the same, I am satisfied that there is more of the false than of the true, as I hope to show.

In order to do so I am sorry to have to ask you to believe that the most distinguished of pathologists *may* be wrong in the interpretation of his findings.

We are all disposed, and generally wisely so, to accept the verdict of the pathologist and bacteriologist as final, but this may become a dangerous obsession if uncorrected by clinical evidence. If a portion of the healthy breast of a woman near the menopause is examined by a pathologist, his report upon it is invariably 'interstitial mastitis.' The kidneys of the great majority of elderly patients are affected by 'interstitial nephritis.' A distinguished American surgeon and pathologist, a short time ago, discovered in every senile prostate removed by him sufficient evidence of past inflammation (fibrosis) in the gland to convince him that all the ordinary prostatic enlargements were due to previous gonorrhœa. 'Cirrhotic' ovaries, only a few years ago, were removed by the jarful. The testes, the thyroid, the pancreas, the salivary glands, and the liver may also be affected by a diffuse fibrosis; in all, cysts, multiple or single, may be found, and none of them need be of serious portent; in all, this form of fibrosis occurs as the result of senile changes, probably vascular, and in reference to it I like to employ the term 'physiological pathology.'

In the breast the diffuse variety of 'chronic interstitial mastitis' produces no tumour, though perhaps some induration, unless a cyst develops sufficiently to become palpable. It is frequently associated with the formation of multiple small cysts[1] (so-called involution cysts), due to contraction of the fibrous tissue and consequent obstruction of the ducts and acini. The cysts are, when small, lined by a cubical epithelium; when they grow large the epithelium has disappeared. They nearly always contain only clear serous fluid. The whole breast is involved, and the condition is practically limited to breasts of patients over 40 years of age. Though I have had many opportunities of seeing cases of this nature, and of watching some of them for a considerable number of years, I have never seen one 'turn

[1] The single cyst with serous contents in the majority of cases is the result of hæmorrhage from injury.

to cancer'; indeed, it seems to me probable that the fibrotic changes characteristic of them work as a protective agency against such an occurrence.

The second type of interstitial mastitis not limited to elderly women is of a localized character, and it is to this variety that the condition is indebted for its evil reputation. In the breast, or breasts, since both may be affected, there may be found one or more tumour-like formations, microscopically interstitial mastitis, and localized to one or more lobules of that organ. There can be little doubt that this condition is not infrequently followed by malignant disease, and I like to regard it as a similar one to the skin tumour known as keloid, of which we already know that it follows with great frequency septic burns, and that it has associations with tubercle and malignant disease.

The second condition for which I ask your attention is one that I, and I think all of you, have always known as fibro-adenoma, the most common of solid benign breast tumours. There are three most interesting points in connection with this growth. The first is, that one rare variety of it develops at puberty, and grows so rapidly and to such a size as to be mistaken for a unilateral hypertrophy (so far as I know, unilateral hypertrophy never occurs) or a sarcoma, a diagnosis which involves needless amputation of a normal breast, because if the true condition be recognized, the small breast may be separated from the tumour and saved. The second is that the fibro-adenoma, when typical, is one peculiar to the breasts of young women under 30, that during the period of lactation it may be found distended with milk, and that its removal is easily effected by the division of its overlying capsule and squeezing it out. The third is, that in the most fibrous form (intracanalicular fibroma) malignant changes are apt to supervene, as they are in fibrous tumours elsewhere in the body.

The following recent case is a typical example:—

J. M., age 55, single, was admitted to a private hospital on April 5, 1910, with the history that *seven* years ago she noticed a tumour of her right breast about the size of a walnut. It gave no trouble until Christmas, 1908, when she began to have 'spasm pains' in it. Since the tumour was first noticed it had gradually increased in size. One month ago the skin in one place over the tumour began to swell, to become discoloured, and eventually it burst.

She had lost no weight and had no previous illness.

Family History.—Father and mother both living and well. No history of cancer or consumption.

On Admission.—The patient, a sallow, thin woman, showed a large swelling of the right breast situated for the greater part on the outer side, and about the size of a fœtal head. The skin was red and shiny in parts, and looked like bursting. In one place, about 1 inch external to the nipple, it had already burst, and there was a small superficial ulcer, $\frac{1}{2}$ in. by $\frac{1}{4}$ in.

The tumour showed multiple bosses, which were bluish in colour, soft,

and fluctuated. The greater part was solid, and the whole was not fixed to the pectoral fascia.

There were no glands in the axilla or supraclavicular region palpable. In the heart and lungs nothing wrong could be found.

On April 6, 1910, Professor Morison amputated the tumour along with the breast. It was not very vascular, and only a limited amount of skin was removed. The wound was sutured with continuous catgut. The contents of the axilla were not dissected out.

On examination of the tumour, on section there was a large solid and cystic tumour contained in a definite capsule. The cysts varied in size from a pea to a large walnut. The fluid that escaped from them was straw-coloured and mucoid in character. In the middle of the tumour degeneration was most marked. In some of the loculi the growth looked like bunches of tape-worms packed tightly together.

The microscopic report was, "Simple fibroma of intracanalicular type; some myxomatous degeneration."

The wound healed by first intention, and the patient left hospital well on April 19, 1910.

On July 2, 1910, she was readmitted with a recurrence of the tumour, and stated that about one and a half months after leaving hospital she noticed a small nodule growing in the line of the healed scar. She looked in good health, and had had no pain or cough.

On examination, about 3 in. from the anterior axillary fold in the old scar there was a rounded tumour, flat on the top. It was pressing heavily on the overlying skin. Two inches below this point there was another tumour firmly fixed to the pectoral muscle but free from the skin. Both tumours were the size of cherries.

On July 4, 1910, a complete Halsted's operation was done, a considerable amount of skin being removed.

On examination of the specimen, both tumours were composed of soft, white growth like sarcoma. They had no definite capsule, but were clearly localized and did not invade the muscle tissue, nor were they actually involving the skin.

The microscopic report was: "There is now no trace of glandular tumour, either simple or malignant. The growth is essentially a connective-tissue tumour. Parts might be regarded as indicative of a very cellular fibroma, but in other parts, and particularly in the most superficial nodule, there appears to be evidence of a true spindle-shaped sarcomatous condition."

The patient made a good recovery, and went home well and healed on July 23, 1910.

On November 5, 1910, she was again readmitted with a second recurrence over the clavicle. There was a hard, fixed nodule adherent to the middle of the clavicle and the overlying skin about the size of a florin.

On November 6, 1910, this nodule, along with the middle third of the clavicle, was removed. It was adherent to the axillary vein.*

Conclusions.—The majority of breast tumours in women under 30 years of age are simple.

The majority of breast tumours following shortly after parturition or abortion are due to septic inflammation (abscess).

The majority of breast tumours in women over 40 are malignant.

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* *She is now* (1915) *quite well.*

Tumours of the breast are stronger predisposing causes of cancer than tumours elsewhere, because of the early senile changes which occur in that organ.

Pain supervening early in the history of a breast tumour suggests a simple rather than a malignant growth.

Puckering of the skin is the most important sign of malignancy in a breast tumour.

Multiplicity of growths is a feature in favour of benignancy.

A bloody discharge from the nipple, associated with a tumour, suggests a papillomatous cyst.

Primary cysts rarely, if ever, occur. Cysts are secondary to other changes in the breast.

Considering the frequency with which malignant changes occur in the breast, and the importance of an early diagnosis when most difficult to make, every tumour should be removed and examined. Personally, as regards the diagnosis of malignancy or the reverse, I have greater faith in the judgement of an experienced surgeon, based on consideration of a macroscopic section, than I have of the opinion of a skilled pathologist derived from examination of an instantaneous frozen section, though both of these have their uses.

All cysts and cystic swellings, except those which are obviously simple, demand excision of the breast. All solid, apparently simple tumours which do not shell readily out of an obvious capsule, demand excision of the breast and pectoral fascia.

The intracanalicular fibroma demands excision of the breast and of the pectoral fascia.

Papillomatous cysts, if their bases or the surrounding tissues are infiltrated, require the complete operation.

So do all obviously malignant growths.

1913

INJURIES TO THE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.[1]

(*The Clinical Journal*, April 9, 1913.)

Injuries to the semilunar cartilages of the knee-joint are common in miners, so that in Newcastle Infirmary the surgeons have exceptional opportunities for seeing them. So lately as on October 8 of last year, one of my colleagues, Mr. Martin, read an interesting and instructive paper in London before the Surgical Section of the Royal Society of Medicine, which has attracted special attention to this important subject.

Until recent years the pathology of the conditions in the knee-joint which caused sudden, sometimes serious, always troublesome, and often fugitive symptoms, were ill understood. Clinically they were grouped together under the title of "Hey's internal derangement of the knee-joint." A definite pathological diagnosis is now possible in the majority of these cases, and the treatment of them has consequently become reasonable. The saying, "It is sometimes impossible to make an accurate diagnosis, but it is always a mighty good thing to try," emanating from Dr. W. Mayo, of America, is one to be remembered.

There are still some unsettled points for discussion which are of considerable importance, and it is chiefly in the hope of interesting you, and also because I have recently had some unusual experiences in these, that I have taken up the consideration of this subject to-day.

The first concerns the most favourable position of the limb to allow of the injury. Two distinct and opposite views were expressed in the London discussion, Mr. Martin expressing the opinion, based on his large experience, that it nearly always occurred during flexion, Mr. Walton, who had made careful experiments on dead bodies, believing that it could only occur during extreme extension. The overwhelming majority of the cases here occur with the limb in a condition of flexion, generally acute, and added to this a twist usually with adduction at the knee. In some, however, it occurs at the end of forced extension, and the following account given by an exceptionally intelligent patient is a case in point.

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[1] Two clinical lectures delivered in the Royal Victoria Infirmary, Newcastle-upon-Tyne.

Case 1.—I. L., age 30, was admitted to the Royal Victoria Infirmary, on October 17, 1912.

History of Accident.—Eleven months previous to admission the patient was playing football. While the ball was in the air he kicked at it, and *at the moment his knee was fully and forcibly extended* he felt a pain so acute that he fell down.

On getting up he found his knee 'locked,' and next day it was much swollen.

Since then he has had frequent recurrences of the pain and locking, brought about by small provocation, and has been unable to work.

Physical Signs.—There was some wasting of the thigh and leg, and a tender spot over the anterior and inner side of the knee-joint.

Operation (Mr. Morison), Oct. 19, 1912.—The greater part of the cartilage was detached circumferentially, and the posterior end of the fragment, which was split transversely, was lying in the joint. A second small split was found on the inner margin of the portion projecting into the joint.

The second point to which I wish to draw your attention concerns the nature of the injury. It is essential, if treatment is to be carried out on rational lines, that clear views should be held as to this, and the success or failure of operative treatment *may* depend entirely upon a diagnosis of the exact nature and the position of the damage done.

In the *Lancet* of February 27, 1909, I drew attention, by a paper entitled "Injuries to the Semilunar Cartilages of the Knee," to what I believed to be a fact—that in every case with a certain definite history rupture of the cartilage had occurred. Previous to this a description of the conditions by which similar symptoms could be produced encumbered the brains of surgeons and still fills pages of text-books, but gradually in America as well as in this country the clouds are clearing, and the view that fracture of the cartilage with displacement of the broken portion is the cause of the joint derangement is steadily gaining ground.

The immediate history, to which I attach so much importance, is one consisting of three sequential events:—

1. A knee injury followed by such severe pain as often to make the patient faint and fall, or turn him sick.

2. Locking of the joint, i.e. inability to fully extend it, and a feeling of painful tension on the hamstrings when attempting to do so, whilst the power to flex it is retained.

3. Swelling of the joint in the course of a few hours after the injury.

A confirmatory symptom might be a crack heard at the time of the accident, and this has several times been described to me, possibly in exaggerated terms, as "like a pistol going off," but it is not constantly heard, and may mean little if it is, for many joints crack on occasion.

The after-history concerns two points, and to the first I may say that I attach, as the patient is likely to do also, the very greatest dia-

gnostic importance. It is recurrence of the condition from time to time after recovery.

The second is that the intervals are free from any disturbance whatever. If they are not, a diagnosis of fracture is either wrong or there are complications.

Case 2.—L. W., age 53, miner. Admitted October 28, 1912.

A year's history of pain in right knee, with limping on walking, and aching at night. Knee worse during wet weather.

Three weeks ago while in the pit his leg caught on a stone and his knee twisted under him. He was unable to straighten his knee, but continued his shift (five hours) and walked home with difficulty. His knee swelled up.

Since accident has not walked at all.

Signs.—Marked osteo-arthritic creaking in joint. Tender spot and wasting of muscles.

Operation (Mr. Morison), Oct. 29, 1912.—Hypertrophied alar ligament and cartilaginous fringe removed. Also anterior third of internal cartilage, the latter with two definite cracks.

What is the cause of all this disturbance ?

After what I have said you may expect the answer to be—the fracture ; but that is surely wrong. Cartilage, unlike bone, if it has any nerves at all, has a very poor supply, and sensation in it is certainly of a very low quality. The pain is the result of stretching of the ligaments, either due to locking of the joint by displacement of the fractured fragment, or to the original injury. It is important to note this, for in exceptional cases no severe pain, such as we regard as of great diagnostic importance, may be felt at the time of the injury, and the patient may almost have forgotten the accident, when a typical attack follows some trifling jerk or twist of the leg, especially such as would occur in catching the big toe and front and inner part of the foot against any obstacle.

Our notes of cases relate how the painful locking sometimes occurred for the first time after turning over in bed, and it is obvious that an injury so trifling could not have caused the rupture of the cartilage found at operation. The explanation I offer of this is, that fracture occurred with the first injury, and that displacement of the separated portion between the bones did not happen then, but later, when the chief damage apparently resulted from a wholly inadequate force. With the displacement, painful stretching of the ligaments is brought about by the mechanical obstacle interposed between the opposed surfaces of the femur and tibia.

Now the law of this country provides that any workman injured in the course of his employment can claim compensation for the disability from which he suffers as a consequence, and some of the best class of workmen, those most eager for work, may resume their occupation at once, or in a short time after the fracture has occurred, and

become disabled at a later date by the displacement of the ruptured fragment. A grave injustice to the man may, and has, followed ignorance of this point on the part of a doctor.*

Locking.—A history of this may be all the knowledge obtainable of it (a symptom), or the patient may come with the knee 'locked' (a sign). By the term 'locking,' all of us have thought that a condition which prevents full extension of the joint, but allows of free flexion, is meant, and with very rare exceptions this would be the correct interpretation. It may, however, be of the greatest importance to recognize that in exceptional cases locking occurs during flexion, while extension is free, or that locking may occur at one time during flexion and on another occasion during extension.

Case 3.—W. P., age 47, miner; admitted November 25, 1912.

Sixteen years' history. While filling a tub, with his knee slightly flexed, his foot slipped and his knee bent sharply inwards with a crack, causing severe pain. He did not fall or cry out but continued his work, and then limped home (quarter of a mile), with pain over inner side of his knee. His knee swelled up. He worked for a week and then had to lie off a fortnight. His knee was locked when in an extended position.

He has had repeated attacks since, followed by *locking in both extended and flexed positions.*

Signs.—Wasting; pain on internal rotation, otherwise movements normal; tender spot on inner and front part of joint.

Diagnosis.—Rupture of internal cartilage, with fragment projecting about middle of joint.

Operation (Mr. Morison), November 26, 1912.—Anterior two-thirds of semilunar cartilage removed.

Pathology.—Double split of cartilage, a tag projecting into the joint.

The importance of this fact and of its bearing upon diagnosis will be best emphasized by the relation of another case, *because if an accurate diagnosis had not been made the joint would certainly have been closed, or some useless tinkering done,* and the patient would have been unrelieved.

Case 4.—J. R., age 41, miner; admitted November 18, 1912.

Twelve weeks before, while lifting a tub his knee twisted outwards; it was fully extended and his heel slid inwards. He heard a click, had severe pain over the internal cartilage, and he dropped. After a short time he limped home supported by two men. His knee never locked until he got

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* *I have just operated on a soldier who in May of this year* (1915) *hurt his knee during a charge. The pain was bad for a while, but he was never laid up, and limped, doing his duty for four or five days, and then got quite well. In September, when getting off his horse and tossing his leg over its back, his knee suddenly went wrong. The pain was bad enough to make him shout and fall. His knee was locked, and remained swollen and locked till I removed the cartilage two months later. It was fractured, and of the bucket-handle variety.*

to bed, when it locked while fully extended. He got someone to move it, and it locked again, temporarily, in a flexed position. His knee became swollen. Locking in the extended position had happened three times since.

Signs.—Slight muscular wasting, no impairment of movement. Tender spot over antero-internal aspect of joint.

Diagnosis.—Posterior rupture of internal cartilage.

Operation (Mr. Morison), Nov. 19, 1912.—On opening the joint both semilunar cartilages appeared to be normal. The rupture was only seen with difficulty, *after acute flexion of the joint, and after the anterior half of the cartilage had been separated circumferentially, and drawn forcibly forwards.*

Swelling of Joint.—It seems difficult to give an entirely satisfactory reason for the rapid effusion into the synovial cavity which follows this accident.

The usual explanation offered is that it is due to ' traumatic synovitis,' and this is probably as nearly correct as we can get it. Inflammation, in my systematic course, is described as of two varieties: (1) Physiological, protective and wholly constructive; and (2) Pathological, commencing when stasis develops, always locally more or less destructive, whatever may be its effects on the body as a whole. This ' traumatic ' synovitis is wholly protective.

Most of you will remember as boys, and perhaps as girls too, ' melting snails with salt.' The same reaction as you saw there is a common protective response to irritation, and it occurs to a marked degree in all serous cavities such as pleura, peritoneum, and joints, in all of which fluid effusion quickly follows any traumatism of the lining membrane.

The Crack which may be heard at the time of the accident we assume to be due to the fracture of the cartilage which has taken place.

Recurrence of the Symptoms.—The cause of this is *non-union of the fracture*, and is the result of sudden displacement of the loose fragment between the ends of the bones.

You will note that a tender spot over the anterior and inner portion of the joint and wasting of the muscles are mentioned in most of the case reports. These signs are not special to this condition, but are found in all organic disturbances of the knee-joint, so that no special diagnostic importance attaches to them.

With some experience the majority of patients learn how to replace the broken portion, and if you wish to retain their confidence you will ask them to try the effect of their own manipulations before you risk your reputation by making any attempt on your own account. Some of them succeed regularly by methods which no one can understand or appreciate, and it would be useless to attempt to describe them. Ordinarily, if firm flexion followed by steady extension fails, no further effort should be made, and the limb is to be left in the most comfortable position, supported by sand-bags with some hot application over the

joint. As a rule, then, in the course of a few days some small spontaneous movement produces a sudden change and the joint has righted itself again. As soon as the displacement is rectified the limb should be put in effective splints and kept there from six to eight weeks. For some months after the injury special care should be taken of it, the object being to secure union of the broken cartilage.

After recurrence the proper course is to recommend operation.

There is another displacement to which I wish to draw your special attention, because a disagreeable experience from which I wish you to derive the benefit I have gained myself, has taught me the importance of it. I trust after hearing this that you will not believe, as all of us occasionally are apt to do, that these details are of ' mere academic interest,' which generally means to say, at the least, lack of enthusiasm. Attention to them may, and does, make the difference between success and failure.

The displacement I allude to is one we describe as the bucket-handle variety, and the name almost explains the condition. It is due to a circumferential tear with separation of the torn part, except anteriorly and posteriorly, and displacement of the torn portion outwards as a loop into the joint. This is not a usual fracture and displacement, though it is not extremely rare, because I have operated upon four such cases during two recent months.

Case 5.—S. G., age 24, miner ; admitted December 12, 1912.

History.—Six months ago, while hewing, he slipped and twisted his knee inwards, his knee being bent at the time. He felt something like a crack and had sudden pain which made him fall down. At the time he was unable to straighten his leg and had to lift himself up by holding on to a tub. He limped home with great pain, and his knee swelled up. He laid up three weeks, and a week later his knee gave way with similar symptoms. Two attacks since. Pain in joint on exercise.

Signs.—No wasting. Tender spot and pain on internal rotation.

Diagnosis.—Ruptured internal cartilage.

Operation (Mr. Morison), December 21, 1912.—Open removal.

Pathology.—Bucket-handle rupture.

Case 6.—J. F., age 34, deputy ; admitted January 6, 1913.

History.—Five weeks ago, while working in the pit in a three-foot seam with his leg crossed under him, a stone fell on to his back and forced him over, putting all his weight on to his left leg. He felt a click in his knee, and had severe pain and shouted out. He lay still for a few minutes, and in getting up his knee " went in " again with a click. His knee swelled that night. Since the first attack he has had about twenty, his knee locking in a slightly flexed position, and it has to be manipulated in again. A fortnight ago he was unable to unlock his knee for nearly a day, and he walked home with his knee slightly flexed and very painful.

Signs.—Wasting of muscles ; tenderness. Flexion limited, but can straighten the joint.

Diagnosis.—Ruptured internal cartilage.

Operation (Mr. Morison), January 7, 1913.—Open removal.
Pathology.—Bucket-handle rupture.

Case 7.—G. M., age 41, miner ; admitted November 11, 1912.
History.—Twenty-six weeks ago, while hewing, his left knee slipped inwards, his knee being flexed at the time. No crack, but bad pain ; he did not fall and had no locking. On walking had a peculiar grating in the joint. He worked for six days afterwards. When he put any weight on the joint he felt something " slipping " on the inner side. The knee became swollen the day after accident, and had remained swollen. Flexion limited. Joint stiff and movements are painful after a resting period.
Signs.—Muscular wasting and inflammation in joint. Tender spot ; marked creaking ; some limping ; full flexion hurts him ; some grating in other knee-joint.
Operation, Nov. 14, 1912.—Anterior three-quarters of internal cartilage removed.
Pathology.—Bucket-handle rupture, with a second split near anterior end. Some free fluid in joint and signs of osteo-arthritis.

Case 8.—A. C., age 22, fireman ; admitted November 5, 1912.
History.—Four months ago his knee was twisted inwards while at work, and he fell to the ground in great pain and with inability to straighten the limb. Got home with difficulty, and was laid up for some days. Knee much swollen. Since then frequent locking of joint, relieved by flexion and extension.
Operation, Nov. 9, 1912.—Internal cartilage found split down its middle without detachment of either end—bucket-handle variety—and projecting into joint. Cartilage removed.

As a rule, with a free incision and good exposure of the joint the displaced loop at once comes into view and no mistake is possible, but every now and again the loop lies in the intercondyloid notch and hugs the internal condyle so closely that it requires careful searching for, and there may be a little difficulty in pulling it out of its seeming hiding-place. Under such circumstances the frayed edge of the still normally attached cartilage is possibly removed in the belief that the explanation of the symptoms has been found, but this belief is rudely shaken when the patient returns " no better," and you will be lucky if he comes back to you.

The disagreeable experience which taught me most of this concerns a patient on whom I operated in the Royal Victoria Infirmary. He had a history and symptoms so typical that it was impossible to misunderstand them, and I opened his knee-joint. The notes say that I removed " the anterior portion of the cartilage, which was frayed at its edge." Four months later he returned with the same symptoms as before operation. Mr. Richardson again opened his joint and " removed the remaining posterior portion of the damaged cartilage." Six months later he came back " no better," and unable to work because of frequent painful locking of his knee. For the third time I opened his joint, more freely than before, and discovered a loop of cartilage

hugging his internal femoral condyle, and still retaining an anterior and posterior attachment to the remaining extremities of the internal semilunar cartilage. Ever since I have had " a good look round," especially in cases where sufficient has not been found to account for the whole trouble, and I have so often discovered what I was looking for that I am convinced many of the patients who are " no better " after operation, or " who have osteo-arthritis " after it, or in whom " adhesions are the cause of all the trouble " of which they still complain, are the victims of a mistaken diagnosis, supported by operation through a keyhole incision.

The operation and incision I still employ are fully described in the article previously referred to (*Lancet*, February 27, 1909), so that I need not occupy your time in useless recapitulation, but I would like to record a recent case showing that from the patient's point of view the operation is not *always* satisfactory, though curiously enough it is one of the most successful in surgery. My expression of surprise at its success arises from a strong belief that no operation which interferes so materially with the anatomy and physiology of the body can be done with impunity, though it must be admitted that in these cases any complaint of failure is rare.

Case 9.—E. S., age 20, miner ; admitted July 2, 1912.

History.—While playing football fifteen weeks ago, he was about to shoot when someone charged him, his knee being flexed and " knocked in over." He heard a crack and felt sudden severe pain, fell to the ground and was carried off. He was unable to straighten his knee, and next morning it was swollen. He laid up for a month. On getting up his knee locked again once or twice, and he was kept off work for six weeks. Since then he had worked in the pit and his knee had locked about thirty times. He is now able to manipulate it himself and straighten it with a click when it locks.

Signs.—Knee is swollen, and a tender spot over anterior and inner part of joint.

Diagnosis.—Ruptured internal cartilage.

Operation (Mr. Morison), July 4, 1912.—The left internal cartilage was found ruptured longitudinally in its anterior portion, and was removed.

Subsequent History.—Patient was at full work six weeks after the operation. He remained quite well until two days before re-admission, when in coming downstairs he slipped, and before he knew where he was he found himself sitting on his doubled-up left leg. He had very severe pain in the left knee-joint and could not straighten it.

The joint swelled up at once.

Re-admitted November 8, 1914.

Signs.—On admission, joint swollen, tense and very painful. All the signs of inflammation present. Joint held in a position short of full extension. No lateral mobility.

Mr. Morison thought that possibly the portion of the internal cartilage remaining behind had been ruptured.

Operation, Nov. 12, 1912.—Joint tensely distended by deeply blood-stained synovial fluid, which on incision escaped with great force. The synovial membrane was swollen and bright red. The anterior crucial

INTERNAL SEMILUNAR CARTILAGE OF RIGHT SIDE, TO ILLUSTRATE MANNER OF 'LOCKING' IN VARIETIES OF RUPTURE (SEMI-DIAGRAMMATIC). A. ANTERIOR. P. POSTERIOR ATTACHMENTS.

Fig. 19.—The knee cannot be fully extended.

Fig. 20.—Full flexion or extension may be interfered with.

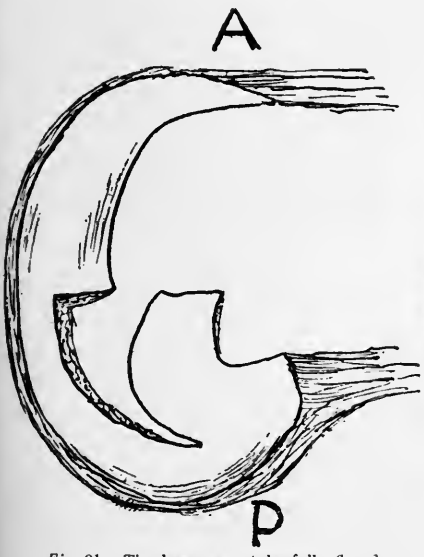

Fig. 21.—The knee cannot be fully flexed.

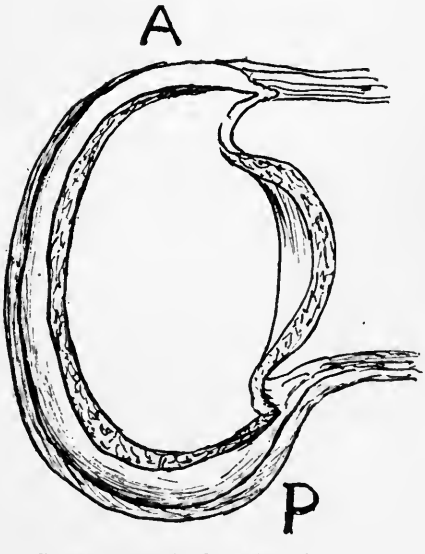

Fig. 22.—Bucket-handle variety of rupture.

ligament was partially ruptured. A strand of fibres the size of a chrysanthemum petal had been detached inferiorly and the blood-staining was due to clot on this, showing where the bleeding had come from. The torn portion of ligament was excised. The remnant of internal cartilage and the rest of the joint were normal. The inferior aspect of the cartilage of the internal femoral condyle was roughened as if from early osteo-arthritic changes. The joint was emptied and completely closed, and the leg was placed in lateral splints to keep it at complete rest. Uninterrupted recovery.

Two points about this case are noteworthy :

1. That the injury was followed by signs of more active inflammation than is usual in these cases. There was severe pain, marked heat, tense swelling of the joint, and striking redness of the synovial membrane when the joint was opened. Locally the signs were those of an early acute septic arthritis, but the absence of serious general disturbance and the moderate rise in temperature present enabled us to exclude sepsis. What was the cause of the disturbance ? You will remember that blood was found in considerable quantity in the joint, and experience has taught us that blood in any of the serous cavities causes inflammation so active as to be often followed by sufficient destruction to result in adhesions (fibrosis).

2. The second point concerns the injury and the change found since the previous operation on the inner condyle of the femur. Is it possible that this serious injury, rupture of the crucial ligament and so-called osteo-arthritic change, were both due to the removal of the elastic pad called the internal semilunar cartilage ? I suspect that both were due to this.

I want to emphasize these facts because I have learned them since the publication of my last paper. *First*, that rupture of the cartilage can occur without the overwhelming pain we have been accustomed to expect, and that the pain is due to *displacement of the fragment* between the bones, and not to the fracture. *Second*, that although ' locking ' is rare except in extension (*Fig.* 19), yet if the fracture is posterior and the displaced fragment gets between the bones behind, the ' locking ' will occur during flexion (*Fig.* 21). A ' locking ' that occurs either during extension or flexion, sometimes the one and sometimes the other, is due to a pedunculated fragment long enough to reach either the anterior or posterior part of the joint (*Fig.* 20). *Third*, that in one form of rupture—the bucket-handle variety (*Fig.* 22)—the displaced fragment may be overlooked during an operation, unless the possibility of such an occurrence is remembered and a careful search made.

A CLINICAL LECTURE ON SOME URETHRAL INJURIES AND THE TREATMENT OF URETHRAL STRICTURE.

(*Medical Press and Circular*, May, 1913.)

When I first came to Newcastle, 25 years ago, stricture of the urethra was one of the most ordinary surgical conditions with which surgeons of the Infirmary had to deal. It has now become so rare that I was surprised last week to find five cases at the same time in my wards. I cannot offer any satisfying explanation for such a change, so intend to leave this portion of the subject for each one of you to form his own conclusions.

With very few exceptions, stricture of the urethra arises from traumatism (rupture) or infection (gonococcal) of it, and the five cases on which I intend to base my remarks offer examples of each.

Illustrative Cases.

Case 1.—R. E., age 11. Admitted August 8, 1912.

History.—Patient quite well up to ten days before admission, when he fell straddle legs on a wall. His perineum was much bruised. It was uncertain if he bled from the urethra. Since then he has had difficulty in getting urine away, and it is constantly dribbling. On his admission there was a nodule in his urethra, and it was thought that it might be an impacted calculus. Mr. Willan urethroscoped him and found that it was an impassable stricture.

Operation (Mr. Morison), Aug. 8, 1912.—The stricture was fully exposed by perineal section, one bougie being passed through the anterior urethra to the front, and another through the posterior urethra, from the bladder opened suprapubically, to the back. The floor of the urethra was opened freely in front of and behind the stricture, which was then divided. It consisted of a mass of cicatricial tissue about ½ in. long. A drainage tube was passed into the bladder from the posterior urethra well behind the stricture; the anterior urethra and the strictured portion were then covered with a strip of fascia lata taken from the boy's thigh; this was fixed to the edges of the cut urethra in front and over the stricture, and the perineal wound was closed over it in front, leaving only space for the drainage tube behind.

The perineal wound healed well, and six weeks later he left the hospital after a No. 11 English bougie had been passed with ease.

He was asked to return for a time once a week for the passage of an instrument.

After-progress.—Returned to hospital January 21, 1913, for the first time (three and a half months after operation) with retention and dribbling of urine through a small perineal fistula. Attempts made to pass catheter failed.

Feb. 18, 1913.—Under an anæsthetic, Mr. Morison passed to-day a 7–10 Lister. At the site of the old stricture there was a definite soft block, but it yielded easily and the bougie was not gripped.*

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* *He had no tendency to contraction after this.*

Case 2.—A. L., age 35, miner. Admitted January 7, 1913.

History.—Eighteen months ago caught between a moving tub and siding and sustained fractured pelvis. Was taken to another hospital and operated upon immediately, as he had retention of urine. He had many other operations during the succeeding four months. Attempts have been made during the past fourteen months to dilate the stricture, but without success. During the last fourteen months has had gradually increasing difficulty in micturating; has had to strain, frequency much increased, stream became a mere dribble. During the past month had several attacks of retention.

On Admission.—Septic looking.

Operation (Mr. Willan), Jan. 23, 1913.—It showed that the urethra had been torn at level of posterior layer of triangular ligament, the bladder end being moved laterally to the right, so that the divided ends were nearly 1 in. apart. Plastic operation by filling in gap with a split portion of the internal saphenous vein, which was sutured to the urethra and wrapped round by a piece of fascia lata. Result is yet uncertain.

Case 3.—R. W., age 32, admitted January 25, 1913.

History.—Urethritis fourteen years ago. Seven years later began to have difficulty in getting water away. Stream became thinner, and there was increased frequency. The symptoms became worse, but no instrument was passed until fourteen days before admission, when he suddenly had complete retention. This was relieved by catheter, and later a bougie was passed. On day before admission, whilst straining to pass urine, perineum and lower part of abdomen suddenly swelled up. After a short relief became extremely tender and painful, and on admission he was very ill with a swelling showing all the signs of inflammation in perineum, scrotum, penis, and lower abdomen.

On Admission.—Incisions in scrotum, penis, over each inguinal canal, also hypogastrium. Further incisions had to be made in flanks later. *Three days later* large sloughs came away from each of the incisions.

Present Condition.—Patient doing well. Wounds granulating up. Is having stricture treated by intermittent dilatation.

Case 4.—T. W., age 64. Admitted January 25, 1913.

History.—For five years had had increased frequency; the stream had gradually diminished; the force was sometimes very good, sometimes poor. In good health until a few months ago. During this time he had had two or three small attacks, which on each occasion localized to a perineal abscess. Two months ago he had a perineal abscess drained. This healed up, and had re-formed within the last few days.

On Admission.—Looked ill and septic.

Signs.—Indurated mass in perineum on either side of middle line. It was cystic in the middle and very tender. Had an impassable stricture of the urethra 5 in. from external meatus.

Operation (Mr. Willan), Jan. 25, 1913.—Perineal section. Stricture divided. Bladder drained through urethra by tube.

Present Condition.—Has done well, large bougies passed every few days.

Case 5.—E. P., age 28. Admitted January 3, 1913.

History.—Six years ago patient had gonorrhœa, and two years later a stricture of urethra developed. He had difficulty in passing water for two years, and then he had perineal section done in hospital in Alexandria. He then returned to England and was operated upon by internal urethrotomy

two years ago (May, 1911). He then had bougies passed every fortnight for two months. He had no more trouble until December, 1912, when a peri-urethral abscess formed.

Signs.—Conical brawny swelling, with point of suppuration at summit immediately below bulb in perineum, inflamed and tender. Stricture at bulb. Perineal fistula.

Operation (Mr. Morison), Jan. 11, 1913.—Patient put in lithotomy posture and external urethrotomy done, the bladder being drained by a tube ; small abscess outside bulbar urethra drained at the same time.

After-progress.—Wound healed quickly. Patient was instructed how to pass bougie upon himself, and a No. 14 English size was ordered him. It went in with ease.

The subject of rupture of the urethra has not, I think, received the attention which it deserves, and it will be my endeavour to instil the belief into you that rupture of the urethra is one of the most serious of accidents, and that unless your skill can prevent, when you undertake the care of one of these cases, the development of stricture as a result of it, you are presiding at the opening of a life-long tragedy.

The rupture may occur from without, by perineal injury (Case 1), or fracture of the pelvis (Case 2), or from within, by straining to overcome the obstacle offered by a stricture (Case 3).

It is to the first of these cases that I wish now especially to draw your attention, because you must realize, or it will not be my fault, that it is of examples like this I spoke just now, not at all too strongly, as being life-long tragedies.

An apparently trivial bruise of the perineum—nothing that any boy who walks along the top of a wall or of railings thinks very much of, an accident which most parents scarcely trouble about and can scarcely be made to understand the serious nature of—has caused all this dangerous suffering, and we have apparently accomplished nothing so far to put an end to it all.

Ordinarily the signs of ruptured urethra, after such an accident as we have been talking of, are three in number :—

1. Bleeding from the urethra independent of the act of micturition.
2. Retention of urine.
3. Swelling in the perineum,

and, if these are all present, there can be no doubt as to the diagnosis, and there should be no failure to realize the serious nature of the injury. The diagnosis may, however, be a much more difficult problem than this, because there may be neither visible hæmorrhage nor retention nor perineal swelling when the patient is first seen. When the urethra is moderately torn by a blunt force enough blood may not escape from the laceration to effect its own discharge, and the only evidence of the tear may be a small amount of blood which has been retained in the urethra and is washed out by the first few drops of urine which are passed. If the urethra has been completely torn across no bleeding

may occur from the anterior torn portion, the escaping blood may pass back into the bladder, and urine more or less discoloured by blood may be withdrawn by a catheter passed to relieve the retention. The perineal swelling in the early stages depends upon either hæmorrhage or extravasation of urine, and neither may be present in sufficient amount to make a palpable swelling. At a later period the perineal swelling is due to inflammatory effusion, and it is then unlikely that any operation will prevent the formation of a stricture.

How should a case in which it is likely, from the nature of the accident, that rupture of the urethra has occurred, be treated ?

I am going to say nothing as to the serious varieties complicated by fractures of the pelvis or urinary extravasation from stricture, because the treatment of those is settled, and I have nothing useful to add.

Let us presume that a patient is presented for whom we make a diagnosis of rupture of the urethra. What is to be done ? Before deciding this, it is necessary to consider what is likely to happen, and how untoward results may be prevented. The passage of urine over any wound is likely to produce inflammation, and it does this in the urethra. The terminations of inflammation everywhere, as you all know, are :—(1) Resolution ; (2) Fibrosis ; (3) Partial destruction (molecular death) ; and (4) Total destruction (molar death), and the urethra is no exception to this rule. Any of the last three endings will certainly be followed by a stricture ; and, as this stricture consists of dense scar tissue, its deadly effects and obstinate tendency to contraction will be readily understood. The chief object of treatment, then, is to prevent all this, and to obtain union of the urethral wound by what we describe elsewhere as " healing by first intention."

The main object of treatment we now see is to prevent, if possible, the entrance of urine or septic organisms into the urethral wound. The first step to be taken is to try to pass, with every precaution against sepsis, a suitable soft catheter, and to prevent the patient, if he has not already done so, from passing any urine on his own account.

We may now find that we have to deal with one of three conditions :

1. The catheter is passed with ease.
2. The catheter can only be passed with difficulty.
3. No catheter can be passed at all.

In the first case (catheter passed with ease), after the instrument has been withdrawn the patient should be sent to bed, kept on a diet limited in fluid, and told to pass no urine on his own account, but to make his wants known, so that the catheter may be used every time his bladder fills. This means, of course, instrumentation at least every eight hours, and as this must be kept up for ten days, these patients are usually best looked after in a hospital. If there is no sign of con-

traction after the ten days have elapsed, it will suffice to pass an instrument once a week for three months, and if nothing has developed in that time, to leave the patient alone. These traumatic strictures develop with great rapidity, and if after three months there is no tendency to contraction, it is unlikely that this will ever occur.

The second condition we have to consider is that following rupture of the urethra, in which a *catheter can be introduced, but with difficulty.*

There are two courses, either of which may be adopted :—

a. Keep the catheter tied in for ten days.

b. Operation.

There are weighty objections to the continuous use of a catheter, the chief of which is that it invariably causes more or less urethritis, and consequently infection of the lacerated portion, and that some urine escapes by the side of it ; and as this is likely to give rise to a stricture, I consequently prefer to recommend operation for this and the third variety—i.e., where no catheter can be got into the bladder.

More than twenty years ago I had the opportunity of carrying out these views in the cases of two boys who were admitted within a few days of each other to the old infirmary, and I will describe shortly the operation I invented for, and carried out upon, them then, since it still appeals to me as the one I like best.

In the first, retention had been relieved by a catheter, but with difficulty. In the second no instrument could be introduced by the urethra, and the bladder had been aspirated.

In the second case I first made a suprapubic opening in the bladder, then introduced a bougie from this opening, guiding it with a finger in the bladder to the internal urinary meatus and urethra, and projected the point in the perineum at the site of obstruction. A free incision in the middle line of the perineum exposed the point of the instrument coming through the posterior portion of the torn urethra, and another instrument introduced from the penile end made the finding of the anterior torn end easy.

In both cases a longitudinal incision was made, freely opening up the floor of the anterior and posterior portions of the urethra before and behind the tear, and the roof and sides of that tube were drawn together and brought into good apposition by interrupted catgut sutures through the whole thickness of the urethra, leaving the floor widely open. A drainage tube was introduced into the most posterior portion of the incision, well behind the suture line, into the bladder, and the opening in front of the drainage tube was carefully packed with antiseptic gauze, so that the lacerated wound was protected by the dressing.

Healing promptly followed in both cases, and on their discharge full-sized bougies could be passed on either with ease. I never heard

any more of one of these after he had left our care, so that I cannot be sure of the result; but the other visited us from time to time for some years, and there never was any contraction of his urethra. The ideal operation described in most books, of circular suture of the torn urethra and complete closure of the perineal wound, is seldom applicable. I have found it to be difficult enough to discover the torn ends in the swollen and blood-stained tissues and to satisfactorily suture the tear by the cruder method I have described, and I believe that it would seldom be possible to obtain a satisfactory result by any more elaborate scheme. My method takes advantage of the knowledge that a longitudinal incision in the urethra causes no stricture, but rather aids in its prevention, and that in the use of free drainage lies the best hope of freedom from serious sepsis.

Inflammatory Stricture.

Both traumatic and inflammatory strictures of the urethra have as their favourite site the neighbourhood of the bulb. In the case of the traumatic variety this is due to the fact that the chief damage in cases of limited injury is likely to occur at the junction of a fixed and a movable portion of the body. For example, in miners, fracture of the spine not infrequently occurs from falls of coal or stone on to their head and back whilst they are stooping forward at work. The fracture will be found at the cervico-dorsal or dorso-lumbar junction—i.e., where fixed meet movable portions. A sharp localized blow on the abdomen, such as that given by the kick of a horse, if sufficiently strong to produce a rupture of the intestine, will cause a tear about the duodeno-jejunal or ileo-cæcal junctions, sites where movable portions join fixed ones. This is the explanation of the frequency with which rupture of the urethra occurs in the neighbourhood of the bulb.

When the stricture is inflammatory, the cause of it is, for clinical purposes, always a gonococcal infection, and in the great majority of cases the obstruction is at the bulbous urethra. The explanation of this is that the bulb is a pouch, and, when the patient is standing or sitting, a dependent part, so that collections of gonococci are to be found there if they are in the urethra at all.

In position and results there is a close resemblance between the traumatic and the infective stricture, but their pathological anatomy separates them very definitely.

The traumatic stricture consists of scar tissue, more or less dense and contractile according to changes which followed the laceration, and it involves the whole urethra.

Infection by the gonococcus leads to pus formation on exposed surfaces, such as mucous membranes and the conjunctiva, but in the tissues this organism seldom causes suppuration, though the inflam-

mation set up by it terminates in fibrosis; and so it happens that around the inflamed urethra a more or less localized area of inflammation terminating in fibrosis occurs, and the subsequent contraction of this from the outside leads to stricture. Under these circumstances the mucous membrane lining the stricture may have entirely recovered its health, and the obstruction then depends entirely upon the contraction of the peri-urethral deposit. This takes a long time to become effective, so that, unlike the traumatic, the infective stricture follows its exciting cause only after months or years. It is important, when we come to consider treatment, to remember this etiology. I am not going to trouble you with the varieties of strictures that have been described, such as single, multiple, bridle, large and small calibre, etc., because these you can learn about from text-books.

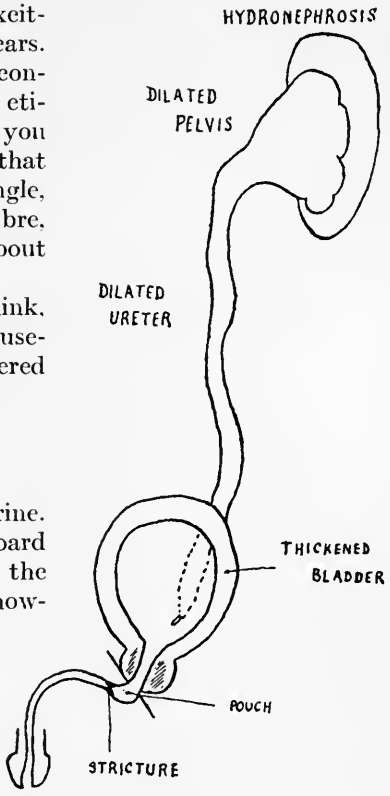

Fig. 23.

Symptoms.—You are all, I think, familiar with the four ancient but useful questions we require to be answered in a urinary case. They concern :—

1. Pain.
2. Frequency.
3. Character of stream.
4. What has been seen in the urine.

Look at the diagram on the board (*Fig.* 23), and remember it and the pathological specimen which I am showing when a case of stricture comes under your care.

Pain.—This is not a feature of uncomplicated stricture, though there may be some uneasiness in the perineum during the passage of urine.

Frequency.—Note the bladder in the diagram. The wall of it is hypertrophied, its cavity is contracted. There must of necessity with such a bladder be increased frequency in the act of micturition during day and night.

Character of the Stream.—A stream diminished in size and undiminished in force is the only characteristic stream of stricture, and this is always found until the stricture becomes so tight that the bladder compensation cannot overcome it. Then the urine may only be

expelled in drops. The 'forked stream' so much in evidence during examinations, and so popular with the laity, has had a very undue importance attached to it. Look at the diagram again, and note the dilatation of the urethra behind the stricture. This will explain a common complaint in stricture patients, and one which often worries them more than anything else. You will for yourselves frequently observe that they have a disagreeable urinous smell, and this is explained by the fact that they are more or less damp with urine. The complaint the patient makes is that, after he thinks he has satisfactorily completed the act of micturition and has dressed, he finds that some urine has trickled away into his clothes ; and, when you remember the dilatation of his urethra behind the stricture, you will be ready to understand how this should happen.

What has been seen in the Urine.—Behind every stricture there is urethritis, and here the chief tendency of it is to fibrosis. This is fortunate, otherwise the dilated urethra, acted upon by the hypertrophied bladder, would frequently be torn (extravasation), and stricture would be even a more serious possession than it already is. If the urethral inflammation leads to partial destruction (ulceration), urine may be forced into the depths of the ulcer, and, as this is surrounded by a protective advance area of inflammation, a perineal abscess results (Case 4). If the urethral inflammation leads to total destruction (gangrene), then diffuse extravasation of urine into the surrounding tissues follows. In any case, the inflamed urethra secretes pus, and this will be found in the urine most frequently in the form of ' threads,' which are casts of the urethral and prostatic gland ducts.

I do not want to say much about extravasation of urine, but would like to remind you that it *can* occur behind as well as in front of the anterior triangular ligament. All students seem to be quite familiar with the fascia of Colles, and can glibly describe how its attachments behind and at the sides drive urine extravasated beneath it up on to the scrotum, penis and abdomen, but they are apparently apt to forget that when the urethra ruptures behind the bulb that urine is extravasated in the cellular tissue of the pelvis, and may bulge below into the ischiorectal fossa, or above in front of the bladder on the lower abdominal wall.

I have twice seen a limited extravasation into the penis—in one case after lithotrity and the impaction of a jagged piece of stone in the penile urethra ; in the second after an internal urethrotomy, in which the incision had been made through the roof of the urethra—and in each the first evidence of anything seriously wrong was a small black patch of gangrene on the glans penis. The cases made a deep impression upon my mind, because both of them promptly died.

Treatment.—The first matter I am wishful to impress upon you

is that every case of stricture must be regarded as a serious problem till the contrary has been proved. I could emphasize this by painful experiences of my own, but they would scarcely carry the same weight as this specimen (exhibited) does. You will notice above the thickened contracted bladder that the ureters are thin, and dilated (*see Fig.* 23) to six times their ordinary calibre; the kidneys are large, but their size depends upon dilatation of their pelvis and calices, because the kidney substance is thinned out, and examined microscopically contains much fibrous tissue. It will surprise you to learn, if you do not know it already, that a patient with kidneys such as these can look "the picture of health," and except for a little trouble in passing his water, considers himself "as sound as a bell." Never be tempted, after seeing this specimen, to do anything rash to a stricture case. The mildest instrumentation may result in death from anuria, the smallest amount of sepsis may cause a deadly infection of these diseased kidneys. Passing an instrument into the bladder of anyone is a serious operation; in these patients it may be a deadly one, and should only be practised under the most favourable conditions.

Before undertaking any treatment, a careful examination of the whole body will be made as before any other operation, but especial attention will be paid to the urine. When I ask a dresser questions about the urine of a particular patient, the usual answer I get is that it is "Quite all right; there is neither albumin nor sugar, and microscopic examination shows nothing abnormal." The possessor of these kidneys would have answered all this dresser's tests, and according to them should have been "Quite all right," but you can all see how "Quite all wrong" he has really been. Another gentleman, perhaps more learned, will attach the greatest importance to urea excretion and will have calculated the exact percentage in a given sample of urine. This may be most misleading. If, however, the urine of twenty-four hours contains less than 1 per cent of urea, no operative interference beyond that called for by dire necessity should ever be undertaken. Do not misunderstand my position in connection with these examinations. They may all, even the most difficult, be useful, and should, consequently, never be omitted, but certain information much more simply obtained is of infinitely more service, and I want to lay stress upon this. I have just read in one of our medical journals the most exhaustive record I have ever seen of the examination of urine delivered from each kidney, by a distinguished genito-urinary specialist, and I was surprised to find that he made no allusion whatever to either of the points to which I attach so much importance. The first of these concerns the specific gravity of the urine, and the second is the quantity of it passed in twenty-four hours. With a normal quantity (40 to 50 ounces) of urine a specific gravity below 1015 is a danger signal, below 1010 is a call to delay any but urgent measures.

After consideration of these points, we now proceed to the treatment of stricture, and when I ask you what it is, I expect as your answer, *Intermittent dilatation with few exceptions.*

Why? Because it is the safest, the least painful, and the most efficacious method, and these should be sufficient reasons for making it *the* operation for stricture.

What instruments are required? The urethroscope is not so essential in the treatment of stricture as the cystoscope is in bladder and kidney surgery, which are now unjustifiable without skilled cystoscopic examination, so that the complicated armamentarium of the specialist is unnecessary.

A set of metallic bougies, ranging from size 1 to size 14 (English) is likely to meet every ordinary requirement if they have added to them a good stock of care and patience and some gentle skill.

The patient is settled in a warm room, he is on a suitable table, warmly clad, and the instruments, the patient, and yourself are surgically clean. Everything is ready for a start.

Which instrument is to be used first?

Look at the patient's urinary meatus, and if it is normal begin with a good-sized instrument, say No. 8. Remember that the meatus is the narrowest part of the urethra, consequently any instrument which can pass that should traverse the rest of the passage. Spasm of the accelerator urinæ about four inches in, or of the compressor urethræ behind the anterior triangular ligament may be mistaken for a stricture, and if the end of the instrument after passing through the penile urethra is not kept in contact with the roof, it may hitch in the floor and its progress is stopped, giving rise to doubt in the hands of the inexperienced. These difficulties are readily overcome, but if there is a stricture the instrument is definitely arrested. Measure the point at which this occurs for future guidance, and try a smaller instrument. Some notion of how large the smaller instrument should be may be obtained by previously noting the size of the stream. After a little manœuvring you have succeeded in getting a No. 3 into the bladder. What are you going to do now? Let this suffice; do nothing more to-day. Be careful with each urethra until you know it. This one may resent no intrusion; but that, with the same treatment, may lead to quite serious disturbance, rigors, fever, and a general flare up, and until you have tested each, you cannot prophesy what the result may be. Do you think any good has been done by passing this one instrument? Certainly there has. A right of way has been established, but in addition to that the patient will tell you, as soon as the irritation of passing the instrument has subsided, that his stream is better than it was before. When I ask what do you effect by passing a bougie through an ordinary stricture, the answer I expect is: Two things. First, mechanical, and second, vital dilatation.

Everyone understands what is meant by mechanical dilatation; no one fully understands what is meant by the changes which our forefathers described as 'vital dilatation,' a useful old name, which, I think, should not be allowed to drop out of use.

Many surgeons now talk, and think, and act, as if the body consisted of a collection of tubes and pumps and levers, and only required mechanical correction to rectify every wrong in it, but this is a dangerous and misleading doctrine everywhere, and for our present purpose as applied to the treatment of stricture, specially so.

I hope to illuminate this question of 'vital dilatation' further in the course of my remarks, as it is one of the greatest importance.

To resume our consideration of the hypothetical stricture case. This is Thursday; we have succeeded in introducing a No. 3 bougie, and have decided to do nothing more to-day. What further course do we tell the patient has to be taken? When is the dilatation to be undertaken again? The proper answer to this question is *not* on two, three, or four days, or a week from this date, but that the time must be governed by the result of instrumentation in this particular patient. This takes us back to our first position, and what the passage of the instrument was intended to do. In addition to some mechanical dilatation, the passage of it has produced "inflammation" of the strictured urethra. Inflammation causes softening of the thickened and contracted portion, and makes the passage of further instruments easier than the first. But, and this is the point, the inflammation produced[1] must be physiological only, i.e., produce no destructive effect, because if it goes any further the ultimate effect on the stricture will be to increase its virulence by adding to the amount of fibrous tissue in connection with it. How are we to act in order to secure this? The patient may anticipate that his first act of micturition will be easier from the mechanical dilatation than it has been for some time, that after this, on account of some swelling of the passage, it is likely for a few days to be more difficult and attended by some smarting pain. *No further instrument must be used until the act of micturition has been painless for twenty-four hours.* The object of treatment, as you will observe, is to produce a reaction in the tissues sufficient to cause softening and absorption of the deposit around the urethra, or, in other words, to produce '*vital dilatation*,' and to avoid such manipulations as will stretch, still less tear, the strictured area.

The subsequent course in favourable cases is easy if it is governed by the same rules. At the second sitting it may be possible to pass two or more instruments, but any painful stretching must be carefully avoided, and a sufficient time for all reaction to subside before further

[1] See my book, *An Introduction to Surgery*, Wright, Bristol.

instrumentation must be allowed after each onward step. There was, it may be that there still is, a saying, " Once a stricture always a stricture," and it serves at least to impress the obstinacy of this disease on the surgical mind. My experience has taught me that it is not true, for strictures the result of infection, which have not been tampered with or spoilt by previous rough treatment, after being kept fully dilated at varying intervals and for variable periods of time, sometimes years, are ' cured ' at last, and the tendency to contraction ceases.

This, as I have previously said, is *the* treatment by election of urethral stricture, but conditions in the stricture or other circumstances may make it not the best, or even render it impossible. For such cases there are two other varieties of non-cutting and four methods of cutting strictures from which we may make a choice.

Continuous Dilatation.—The two indications for this are :—

1. Emergency.
2. Urgency.

I will illustrate each.

1. Suppose you have been asked to go, possibly some miles away, to relieve a patient of retention in a case of stricture, and after enduring great anxiety, from the difficulty of introducing an instrument and inability sooner to relieve the patient's suffering, have at last succeeded in getting it into the bladder, you tie it there. You have encountered a case of what I mean by " *Emergency.*"

2. A sea captain consults you. He has had a stricture for years, and has occasionally used a bougie to dilate it. He has just left his ship. During his last voyage the stricture was worse, and he has failed in his endeavour to pass his usual instruments through it. He has to rejoin his ship in ten days and go to Australia. What is to be done ?—Send him to bed and tie an instrument into his bladder. At the end of a week his urethra will almost certainly admit an instrument of any size, and he will again be master of the situation. The picture I have drawn is one of " *Urgency.*"

What size instrument is to be passed, and how far should it pass into the bladder ? Any size of instrument less than the stricture will do, and it should reach to just inside the bladder, no more. This position is readily found by withdrawing the catheter gently till the bladder contents cease to escape, then gradually pushing the instrument in till they commence to flow.

This treatment, tying an instrument in, for hours or days, is what is meant by continuous dilatation; but I do not want to leave you here, because consideration of the principles involved will serve to explain many ill understood difficulties in surgery. Only a few months ago I was badly mauled by a distinguished company of surgeons because I would not accept their view that a dilated common

bile-duct with a stone in it was dilated because of the pressure of bile above the stone.

Why would I not accept that view? Because I believe that no foreign body which could enter any of the muscle-coated tubes of the body (the urethra has abundant muscle in its walls) could ever block it for more than a short time, unless that tube was paralyzed by complicating disease. Whether or no, this is the principle applied in the continuous dilatation treatment of stricture, and this is what it means. When a catheter is first introduced it is gripped by the urethra and by the stricture, if any normal tissue is left in it, and the spasm may last for some hours. Sooner or later the urethra, and with it an ordinary stricture, relaxes, and then dilates (vital dilatation), soon reaching an abnormal state of dilatation. At the end of twenty-four hours the stricture which would only admit size 1 will now take size 4 with ease, and in the course of another few days the dilatation is complete unless scar tissue in the stricture prevents it. After the dilatation has been completed, it should be maintained by the regular use of a bougie. The disadvantages of this method are that it necessitates confinement to bed during the treatment, and still more important than this, a more obstinate type of stricture than before may be the consequence of it. The reason of this is that tying an instrument into the urethra always causes urethritis, and a bad urethritis, terminating in fibrosis, will increase any existing stricture.

The third non-cutting method, which we occasionally use, and for doing which it is almost necessary to be apologetic, is called *rapid dilatation*.

Beds, as you know, in our infirmary are very scarce, and it is impossible to keep strictures in for any length of time.

All who have had experience of stricture cases know what unsatisfactory patients they usually are. Seized with retention, they demand and must have attention at any hour of either night or day, and are loud with their protestation that if things can only be put right this time it will not be their fault if such trouble is occasioned again. When they see, or hear, urine begin to trickle away through the catheter, they invariably "Thank God," and when the operation is completed they almost invariably forget to pay you or to come back till they are in a similar predicament again. Ordinary measures are useless for such patients. Under an anæsthetic, we pass the conical bougies, known as Listers, from the bottom to the top, wash out with and leave three or four ounces of boracic lotion in the bladder, and send them home next day with a bougie, to be passed once a week, and directions—seldom carried out—as to how it should be used.

Cutting Operations.—We have now to consider cutting operations in the treatment of strictures.

There is one stricture which should always be cut, the meatal stricture.—Why? Because the meatus is specially sensitive, the dilatation of a meatal stricture is consequently unusually painful; because dilatation is not successful, as the stricture is resilient and contracts after each dilatation; and because a cutting operation is safe and satisfactory.

Internal Urethrotomy.—The two indications for this are:—

1. Resilient stricture.
2. Irritable stricture.

The operation of internal urethrotomy is not a popular one with general surgeons, who seldom like to cut what they cannot see, or to use knives in dark holes, but it has still considerable vogue amongst specialists, and the indications for it are as follows:—Certain strictures are elastic, and readily dilated, but no sooner has dilatation been accomplished than they tend to return to their original condition, and this occurs time after time. Such strictures are called resilient. The penile urethra is their seat of election; incision is the best method of treating them, and as their situation in the penis is the safest one for internal urethrotomy, this is the method of choice.

Then, as I have previously mentioned, certain individuals may be made very ill by the passage of instruments through the stricture; indeed, I have known a patient, otherwise apparently healthy, who was incapacitated for a week every time an instrument was used, and in spite of every known care being taken before and after its use. Such strictures are called irritable, and it is a curious fact that division with a knife usually puts an end to all further trouble from them. As they are usually in the penile urethra, internal urethrotomy is the method of choice.

External Urethrotomy.—The two indications for this are:—

1. Bad stricture—Cystitis.
2. Stricture, with abscess or fistula.

By external urethrotomy, I mean division of the stricture on a guide passed through it. Symes' staff is the guide always exhibited, but I think surgeons will seldom use it now. As the operation is always done through the perineum, it is sometimes called perineal section, but this is a distinct procedure, and should be distinguished as such.

All traumatic and many ordinary strictures which have been subjected to ordinary surgical usage are composed of scar tissue, and if this is dense and abundant, attempts at ordinary dilatation are painful and useless efforts.

These should be treated by external urethrotomy when complicated by cystitis, as they usually are, because drainage is the best treatment for cystitis and division for the stricture.

Urinary fistulæ, most common in the perineum, and due to stricture, will always heal if the stricture can be cured, and external urethrotomy is not essential for all of them, because the stricture may be curable by other means. At the same time as we remember this —a fact too often forgotten by candidates in surgical examination— it is important to recognize that fistula and abscess mean ulceration behind the stricture, and that the most satisfactory method of treatment for these cases is often external urethrotomy.

Perineal Section.—The two indications for this are :—

1. Impassable stricture.
2. 'Impossible' stricture.

By impassable stricture is meant one which has resisted prolonged, repeated, careful, skilful attempts to pass instruments into the bladder through the urethra.

By 'impossible' stricture, I mean a condition resulting from rupture and displacement of the torn ends of the urethra (most frequently arising from fractured pelvis), where the urine is passed through a fistulous opening in the perineum. As the anterior end of the urethra is often entirely occluded, it is impossible to get any instrument into these patients.

Perineal section is the treatment of both, and the operation, as usually performed, is done by cutting down through the perineum to a guide in the urethra and in contact with the anterior face of the stricture. I would like to add to this a method of opening the posterior urethra as well. In 1890 I was helping a colleague in the old infirmary with a perineal section on a bad stricture. The anterior urethra was easily found, opened on a guide, and the stricture was exposed, but no opening into it could be found. After long and unavailing efforts had been made to reach the bladder, I suggested that it should be opened above the pubis, that a guide should be introduced from the bladder into the urethra, and that this should then be opened on the guide and the stricture divided. This programme was successfully carried out, and so far as I know, for the first time. Whether this is so or not is of little consequence, but it is important to remember the method, for on several occasions since I have escaped from a difficult situation by means of it.

Excision of the Stricture.—I can say nothing as to this that you cannot read in your books, but I believe that it is a neglected method, one which has never been properly worked out, and that in the future it may occupy a much more important place than it does now in the treatment of strictures.

1914

A CLINICAL DEMONSTRATION OF SOME INTERESTING CASES, ILLUSTRATING THE PRINCIPLES OF GROWTH AND REPAIR IN BONE.

(*The British Journal of Surgery*, No. 3, 1914.)

Fracture in the Site of a Gumma. A Rare Case.

A heavy, strong man, age 20, had suffered from 'rheumatism' in the thigh and leg which had disturbed him at nights for three months. Whilst walking in the street, his thigh bone snapped. A skiagram showed that this was not due to sarcoma.

The facies of the patient suggested congenital syphilis, and a Wassermann reaction was positive. The marked deformity of the broken bone could not be reduced by ordinary measures (*Plate XIV*A).

Operation, July 22, 1913.—Showed a rounded small granuloma in the medulla at the site of fracture (*Plate XIII*). This was scooped out and the femur plated. Mercury and iodide were given.

Healing of the wound occurred by first intention, and the femur united normally (*Plate XIV*B and C).

Removal of Foreign Body from the Skull. Different Behaviour of Bone Grafts according to their Size.

A boy, age 16, was trephined for the removal of a piece of toy cannon and portions of shattered skull from his right frontal region on January 12, 1894. The wound was left packed with iodoform gauze, the sutures not being tied until the next day (January 13). On January 16 (four days after the operation) the wound, which appeared to be free from infection, was re-opened, and a portion of the skull of a microcephalic idiot, previously drilled, was transferred to fill in the gap which had been made with the same trephine. Small chips of bone, also from the idiot's skull, were placed in the gap made by the cannon.

Examination of his head eighteen years later showed that the trephine opening appeared to be filled up by new bone; this was confirmed by skiagram (*Plate XV*.) Where the chips had been placed, however, there was a small gap without bone, and in it the cerebral pulsation could be felt. In this case, the large portion of bone had been more successful than the chips. The latter must have been slowly absorbed, for six months after operation the opening was hard all over.

Grafting of a Portion of the Tibia for Tuberculosis.

In August, 1911, a boy, age 16, had the upper two-thirds of his left tibia excised subperiosteally for tuberculosis (*Plate XVI*A), the epiphysis being left. Previous to this, two operations (two and three years before)

had failed to remove the disease. In August, 1912, a skiagram showed very little bone regeneration, and the leg was useless (*Plate XVI*B).

Operation, Aug. 29, 1913.—A strip from the anterior border and surface of the patient's right tibia was placed in the gap of the left tibia and in contact with the freshened ends of the remaining bone, as described by Dr. Murphy, of Chicago (*Plate XVI*C). The wound healed by first intention, all except the upper 1½ inches. On removing the dressing for the first time at the end of ten days, the scar tissue over the upper end of the graft was found to be dead for about 1½ inches, and the bare end of the graft was exposed. A dressing was re-applied and left for a fortnight. At the end of this time the slough had separated, leaving the end of the graft bare. This slowly covered up with granulations; none of it was cast off, and the wound entirely healed. Union is firm at the lower, but is scarcely perfect yet at the upper end. There is, however, so little movement that the limb has to be examined carefully to elicit it, and there can be no doubt that firm union will occur in the course of a few weeks.* The new graft can be felt to be enlarged to such an extent that the one tibia now feels as big as the other (*Plate XVII*A, B).

Twenty years ago, after watching the results of sub-periosteal resection of bone, which was then a fashionable operation, I determined to have nothing to do with it, and remained steadfast to this view until I heard the convincing address of Stiles and noted his results.

In my case the periosteum had been much interfered with by previous operations, and though I took every care to maintain its integrity as far as possible, the result was unsatisfactory, and should be a warning to select suitable cases only for Stiles's operation, and to graft at the time of the resection operation in doubtful ones. *Plates XVI*B, C, *XVII*A and B illustrate progress throughout.

Bone-grafting of Leg Fourteen Years ago.

*Plate XIX*A shows the skeleton of the leg of a boy, prepared and preserved by Mr. G. Grey Turner.

The patient in 1897 had acute septic osteitis of his left tibia. The diaphysis was removed by the late Dr. Arnison, the ends of it being sawn through close to the epiphyseal lines. In 1899 the wound was completely healed, the epiphyseal ends were present, but there was no trace of intermediate bone. The leg was much deformed.

Operation (Mr. Morison), at age of 16, 1899.—The scar was opened up, and a deep trough made between the anterior and posterior muscles of the leg. The surface of each end of the remaining bone was freshened with a saw, and a portion of the fibula of a young adult whose lower limb was amputated at the same time, was inserted, with its muscular origins and periosteum intact. Numerous holes were bored into the foreign fibula with a drill, and the sawn edges brought into contact with the sawn epiphyseal ends of the tibia. The bone was not fixed with any pegs or wire, because this seemed unnecessary. The entire wound was closed, and healed by first intention.

Six weeks later, the scar broke down at its lower end, and a small portion of the foreign fibula was discharged. A sinus discharged for six months, and then the wound healed.

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* *It did.*

In March, 1905—six years after the bone-grafting—the leg was amputated through the knee-joint on account of failure to grow, and deformity (*Plate XVIII*). The specimen showed the foreign bone in position and still containing the drill-holes. It was united by bone to the tibial epiphysis above, and by strong fibrous tissue below (*Plate XIX*B). There had been some growth from the upper epiphysis, but very little from the lower. The foreign fibula was not more than a third of the size that it was when the operation was done. The patient's fibula was much thickened and bent, so that the sole of the foot looked inwards. The tuberosities of the tibia sloped from outwards, downwards, and inwards.

Apart from the fact that this operation was done fourteen years ago, it is of considerable interest in the recently revived questions that have arisen in connection with bone transplantation.

Bone-grafting in the Arm.

This man, age 25, for nine years had known of a swelling in the shaft of his left humerus; but of late it had grown more rapidly. A skiagram showed this to be a chondrosarcoma (*Plate XX*).

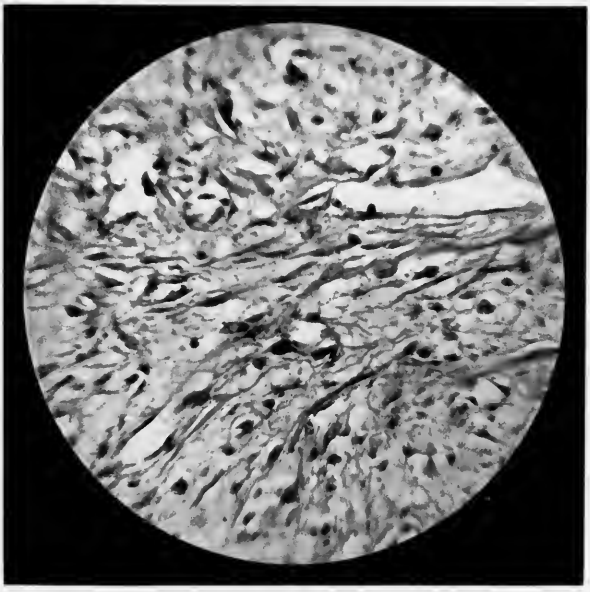
Operation, November, 1912.—An incision was made, commencing below the clavicle, following the cephalic vein between the insertions of the deltoid and pectoralis major, and down the external intermuscular septum (*Plate XXIV*A). The lower end of the incision extended to near the external condyle of the humerus. The muscles attached to the humerus were divided about $\frac{3}{4}$ in. from their insertions, the long head of the biceps being dissected free from its groove. The upper end of the humerus was sawn through obliquely, from the tip of the tuberosity to the lower edge of the anatomical neck. The lower end of the humerus was sawn through transversely at the junction with its middle and lower third, and the intervening part removed. The left fibula was exposed, and the periosteum was separated from it except on the inner side. It was then divided obliquely above and transversely below. Holes were drilled in it, and it was placed in the gap left by removal of the humerus and fixed by Lane's plates to the sawn humerus at the upper and lower ends (*Plate XXIII*). The pectoralis major in front, and the latissimus dorsi and teres major behind, were attached to the anterior and posterior edges of the deltoid, the lower end of which was sutured to the divided inner and outer head of the triceps. The long head of the biceps was attached to the under surface of the deltoid by catgut loops. That these have formed strong attachments can be seen in the photograph (*Plate XXIV*A and B).

The wounds in the leg and in the arm healed by first intention and without constitutional disturbance.

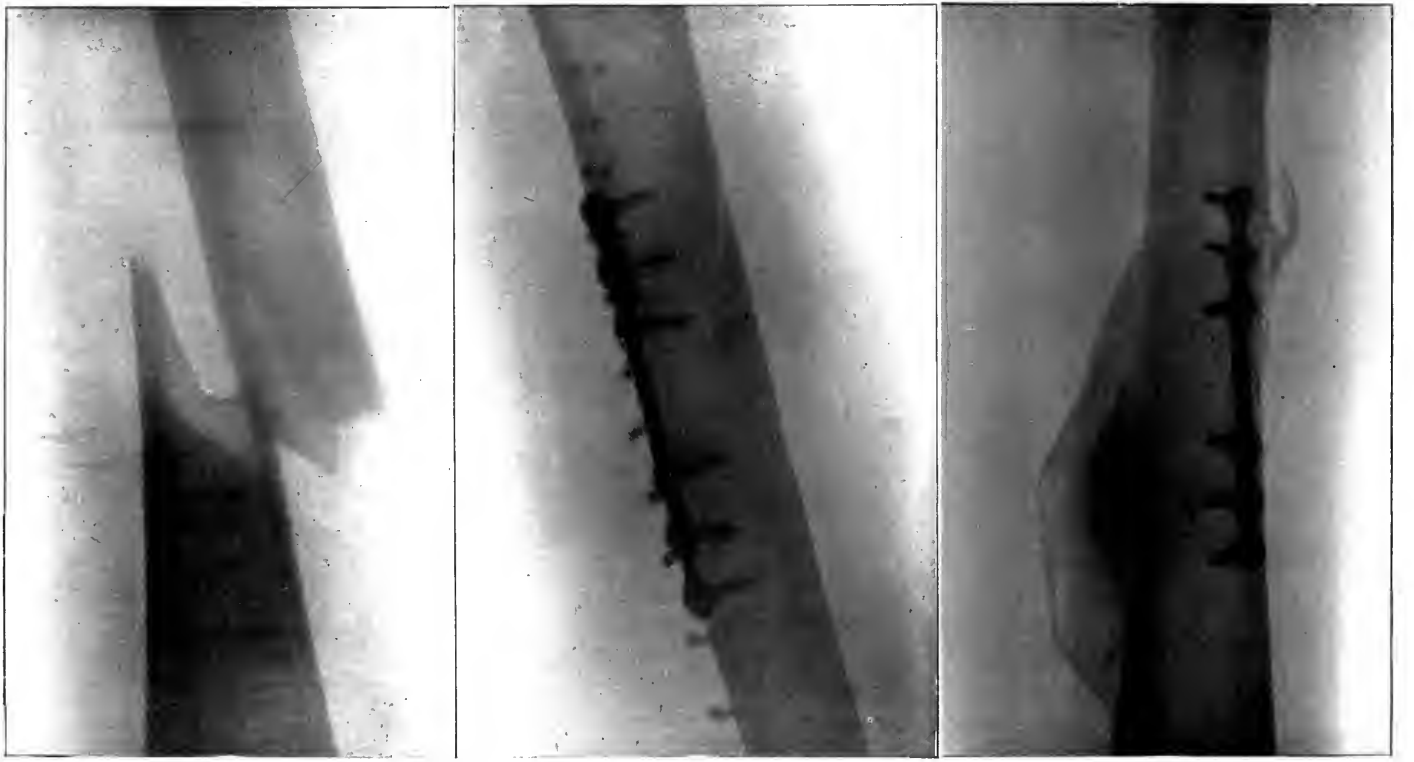
Three months later, a small blood-stained bleb appeared at the lower third of the arm-scar, and this discharged a small quantity of serum. This had healed from time to time, but was still not sound. When the sinus was open a probe could be passed to the bottom on to a small area of bare bone, which the skiagram shows to be eroded. [I do not understand the meaning of this, but I have noted it in other cases where a foreign body, even though sterile, had been too close to the skin.] The curious thing is that this sinus has nothing to do with the plate, but is on the fibula, some inches away.

At the end of three months there was complete and apparently firm union at both ends of the bone. I then did a foolish thing, recommending active exercise with dumb-bells to increase the function of the muscles of

PLATE XIII.



TISSUE REMOVED FROM THE FEMUR, SHOWING SIMPLE GRANULATION TISSUE.
No evidence of malignant disease.

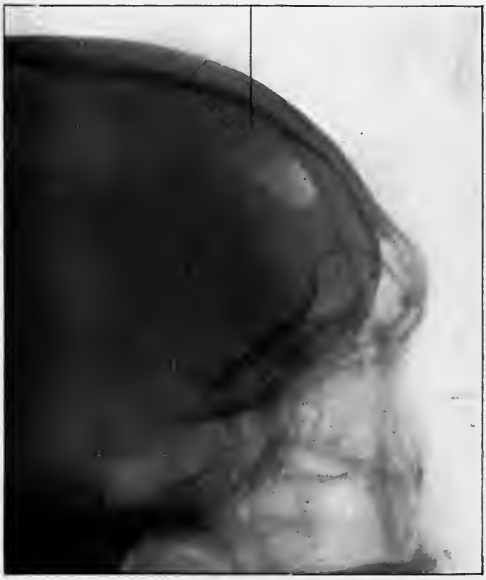


A *B* *C*

FRACTURE OF SYPHILITIC FEMUR.

A, Before Operation. *B*, One week after Operation. *C*, Four months after Operation: plate behind left Femur: the swelling is callus.

PLATE XV.

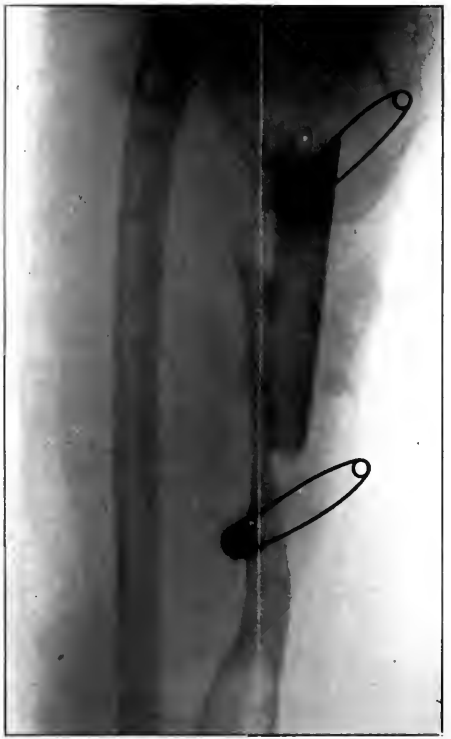


[The upper dark area was filled by a disc of bone, the lower light area by chips.

PLATE XVI.

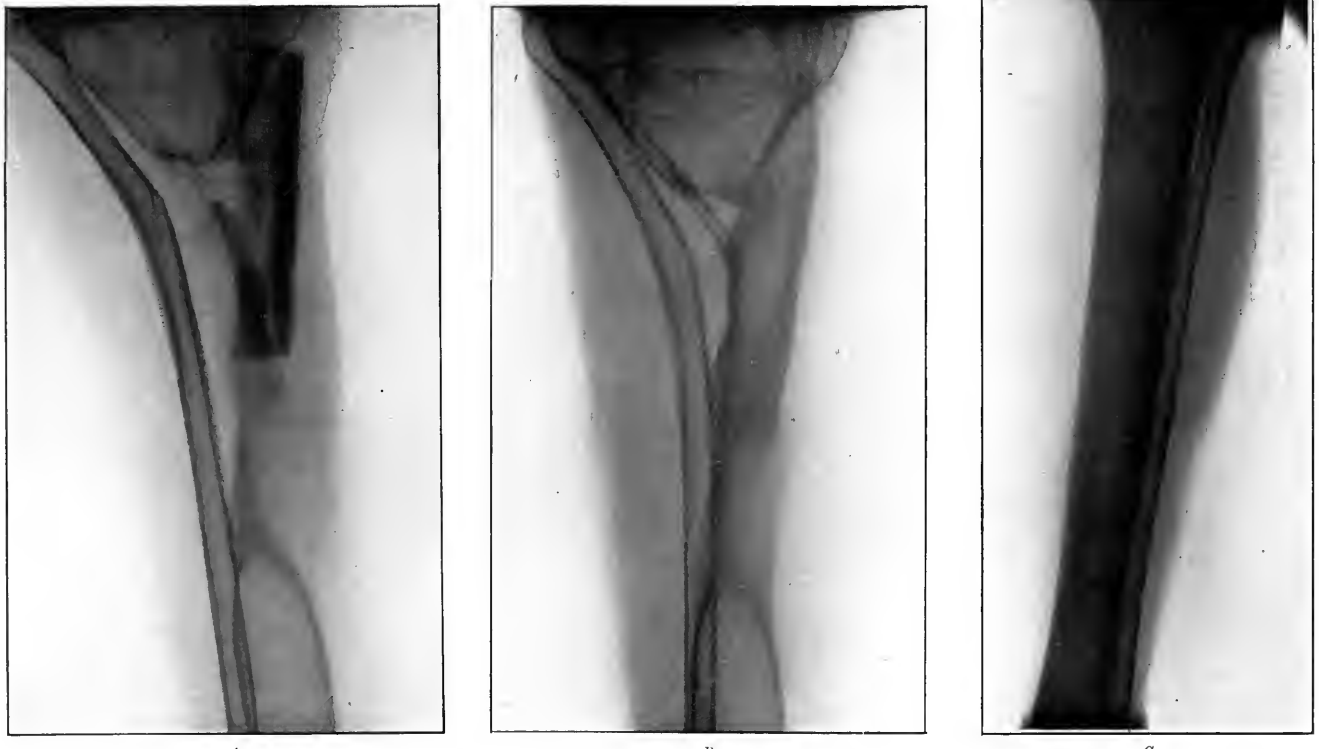
A

B



C

A, Skiagram showing Tuberculous Osteitis for which Excision was done. B, Before Final Operation, showing Failure of Osteogenesis. C, One week after Operation, showing Bone Graft in position. The safety pins were in the dressing.



A *B* *C*

A, Fifteen months after Operation, showing New Bone extending upwards and downwards from Graft. *B*, Two years after Operation, showing restoration of Tibia. *C*, Skiagram showing complete restoration of Tibia from which Graft was taken.

PLATE XVIII.

Result of Bone-grafting six years before.

A

SKELETON OF LEG. Note hypertrophy of Fibula and atrophy of transplanted bone.

B

SKIAGRAM OF SKELETON LEG.

PLATE XX.

CHONDROSARCOMA OF HUMERUS

PLATE XXI.

A

Six and a half weeks after Operation. Graft of Fibula attached to lower end of Humerus by Lane's Plate.

B

Three months after Operation.

PLATE XXII.

Six months after Operation. Note separation at the upper end.

PLATE XXIII.

Showing appearance ten months after Operation. Note drill holes.

A

Ten months after Operation. Shows Line of Incision.

B

Showing Muscles in Anterior and Posterior Folds.

PLATE XXV.

A

Excision of Lower End of Humerus. Shows full flexure.

B

Same Arm as *A*. Shows full extension.

PLATE XXVI.

A

Same Arm as Plate XXV *A* and *B*. Plate behind right elbow.

B

Same Arm as previous figures. Plate on side. Right elbow.

the arm. Shortly after this was begun we found that the upper end of the fibula had become detached from the upper end of the humerus, and there is still non-union. I am at present waiting to complete the operation by transplanting a portion of the tibia and rejoining the upper end. Even though the patient were left as he is, he has a quite useful arm. He can voluntarily flex and extend his arm and forearm freely and strongly, and can abduct his arm to about 30 degrees. The movements at the elbow-joint are complete. He is much better off than with an interscapulo-thoracic amputation; but I hope not to be disappointed in making the operation a complete success, because the case seems to be unique, as it has been possible to retain the head of the humerus and the shoulder-joint.

On examining the arm, the bone seems to be thick, but skiagrams appear to show that it is very little thicker than when put in. There is some callus at the junction of the lower end of the transplanted fibula.

The disappointment of this case has caused me to think. I have asked myself why the fibula naturally is a small bone and the tibia a large one, and the only answer is that the size depends on an "inherent capacity for growth." Dr. Murphy says that the growth of new bone depends on the need for it, and that the amount will equal the functional requirements. The enlargement of the fibula in the skeleton that I have shown gives this view some support, because it has undergone considerable hypertrophy; yet it is very far from being as large as an ordinary tibia would have been. In all Dr. Murphy's cases he appears to have grafted with the tibia, and they show that a graft from the tibia will grow very large and will certainly fill all requirements, as Dr. Murphy says. There is no evidence that I have seen in favour of the view that an inherently small bone, grafted, will grow into a large one, or will serve as a scaffolding on which a large bone will grow. I raise this point as an important one, because I think I made a mistake in using the fibula instead of the tibia in my patient.

During the last three years in bone operations, I have carried out Lane's excellent technique, with the exception that I use alcohol gauze and corrosive wool for the dressings.

Myeloid Sarcoma of Tibia.

This man, age 42, had a myeloid sarcoma of the upper end of his tibia of seven years' duration and the size of a football (*Fig.* 24).

On January 29, 1907, I scooped away the growth, which had destroyed its anterior bony covering, then swabbed the bony cavity that was left with pure carbolic acid, and packed it with towels. At first there was marked deformity, but the immense cavity gradually contracted, until now (six and a half years later), except for the scar, it would be difficult to say which tibia had been affected.

There has been no recurrence.

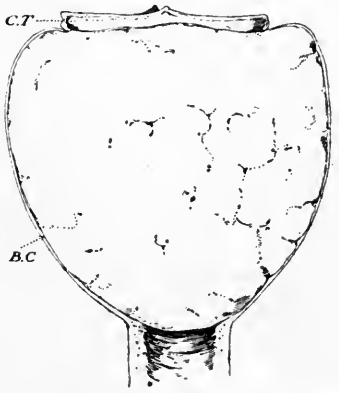


Fig. 24.—*C.T.* Cartilage of head of tibia. *B.C.* Bony capsule. Note extreme thinness of the latter where it surrounds the tumour.

Excision of the Lower End of the Humerus.

The patient, a man, had sustained a backward dislocation of the elbow-joint three months previous to operation, and had a useless arm.

Operation, 1901.—The lower end of the humerus was excised after cutting transversely across the triceps muscle. The upper end of the radius and ulna were left alone.

The present condition of the man is that he has full movement of the joint (*Plate XXV*A and B), a very strong arm, and is head gamekeeper of an important sporting estate, a situation he could not hold if his arm was not more than ordinarily useful. No one there knows of his deformity.

Any physician seeing the photos would say, "This is a typical Charcot's joint," and the radiographs (*Plate XXVI*A and B) would support that view. My object in showing them is to have a chance of expressing a view I hold with regard to osteo-arthritic joints. It is to the effect that the amount of bone atrophy or hypertrophy depends upon the amount the joint is used, and that depends upon the presence or the absence of pain. A painful joint will be an atrophic, a painless one a Charcot's, and one sufficiently painless to function will be of the hypertrophic variety.

NOTES ON LANE'S OPERATION OF ILEOSIGMOIDOSTOMY.

By Rutherford Morison, F.R.C.S., and Hamilton Drummond, F.R.C.S. Ed.

(*International Journal of Surgery*, April, 1914.)

The remarkable observations and conclusions of Sir Arbuthnot Lane on intestinal stasis, both at first scouted as untrue and impossible, are now receiving world-wide attention. His opinions carry such weight and the consequences of action based upon them are so momentous, that anyone who can aid in the discovery of their truth or otherwise should regard it as a duty to do so. This is the reason for our present communication. Mr. Hamilton Drummond has taken up the after-history of the patients, the *x*-ray findings, etc., whilst I am responsible for the selection of cases, of the notes of them, and for the operations.

For many years I have been accustomed to warn students regarding adhesions and kinks in the abdomen as of any surgical importance unless proof was positive that they were, and an explanation of my present position is necessary, or it may be misunderstood.

Through the kindness of Sir Arbuthnot Lane I saw some of his work, and was enabled to make sufficient inquiry as to his results to satisfy me that, whatever my doubts might be as to the explanation of them, my duty was to give the operation of ileosigmoidostomy a fair trial in cases of tuberculous septic joints. Up to date I have not felt justified in performing the operation on cases amenable to surgical and medical treatment on ordinary lines; so that in considering the results we offer, it is only fair to emphasize the fact that operative treatment

was limited to cases which had resisted all other measures, and which, so far as I could judge, were hopeless unless some unusual measure could arrest their steadily downward progress.

The operation I have performed was, except in two cases, as nearly as I could make it that of the originator, except that after opening the abdomen I passed the tube from below into the pelvic colon at once, instead of waiting till the anastomosis was made. When this had been completed the tube was then easy to guide on into the ileum, where it was left. If there was difficulty in passing the tube into the colon from below, I occasionally found it easier to open the colon and pass it from above, and I then used the opening in the colon for the anastomosis. Once I failed to get the tube in either from below or from above, and had to give up trying, though I completed the anastomosis. This case, in every respect, did as well as those in which the tube was used, so that this does not appear to be essential.

Some of the patients have loose frequent motions for a few days after the tube is removed, but these quickly disappear, and a study of the *x*-ray plates makes the reason for this clear. It is that material discharged into the rectum is sent back into the colon for absorption of the fluid portion and a daily solid motion is then the rule.

But when the entire colon is resected, after a few days of loose evacuations, the same occurs, and a daily solid motion may be expected. The explanation given does not hold good for this. What happens then? Except for the light thrown by *x*-ray pictures (Hamilton Drummond, *Brit. Med. Jour.*, January 31, 1914) I can only suggest an answer to the question by relating a single experience. Three months after excising the whole colon of an adult female for tubercuIous ulceration, she developed intestinal obstruction from adhesions. On opening her abdomen I found the last foot of ileum immediately above the anastomosis hypertrophied, dilated, and filled with pultaceous fæces. There was no obstruction at the site of the anastomosis, and it was obvious that the terminal ileum was compensating for the absent colon.

Case 1.—*Tuberculous hip.*

M. W., age 15.

History.—Discharging sinus from left hip off and on since age of 2. Sometimes it would remain healed for as long as one year.

Signs on Admission.—Discharging sinus over outer side of left hip. Great wasting of all the muscles of the thigh and leg. Leg flexed, adducted and inverted. Large inflammatory swelling above the sinus. Left leg one inch shorter than the right. *X* rays showed that the neck of the femur had disappeared.

Operation (March 16, 1911), ileocolostomy.—Operation complicated by general adhesions of omentum to anterior abdominal wall.

After-progress.—Sinus was quite healed when she left hospital twelve days later. April 24, 1911, wound quite healed. Is remarkably well. January, 1914, healed and well.

Case 2.—*Tuberculous hip-joint.*

T. H., age 7.

History.—Of tuberculous hip-joint with septic sinus which would not heal.

On Admission.—Is complaining of severe pain at nights. Cannot sleep. Is a feeble, anæmic looking boy.

Operation (Nov 17, 1910).—Large septic tuberculous abscess in the thigh opened and scraped. Child kept out on balcony.

Operation (Jan 31, 1911).—Sinus further scraped. Little improved up to date.

Operation (Mar 5, 1911), ileocolostomy.—Sinuses much healthier looking when he left hospital.

March, 1913.—Stasis present. Bismuth meal passed into cæcum. Remained in transverse colon for six days afterwards.

January, 1914.—Wounds now perfectly well, and have been for a long time.

Case 3.—*Tuberculosis of hip.*

R. B., age 8, male, was admitted on May 8, 1911, with a tuberculous hip. The right hip was partially ankylosed and there was the mark of an old scar on the thigh below the right anterior superior spine. An abscess was present in this situation which was opened and scraped and stitched up fourteen days previously. This healed by first intention. There was a scar as if an excision of the right knee had been done, and the knee was ankylosed. There was shortening of the right leg, viz., three inches. He had worn a Thomas hip splint for a long time. He does not know how long. The temperature was normal; tongue clean; bowels regular; complexion pasty; appetite poor; disposition quiet and dull; micturition poor; chest, nothing abnormal.

Operation (May 20, 1911), ileocolostomy.—Good recovery.

Patient died in January, 1913, from meningitis.

Case 4.—

T. M., age 7, male, was admitted on May 6, 1911.

First Operation (May 9, 1911).—Mesentery contained numerous tuberculous glands. Appendix enlarged and removed. Ileocolostomy.

Patient was re-admitted on July 27, 1911. He had been in bed ever since leaving hospital. He had two discharging sinuses over the left hip-joint as before the operation.

Second Operation (Aug. 3, 1912), Prof. Morison.—Amputation at the hip-joint with primary ligature of the femoral artery. The upper end of the femur was so softened that it broke across at this point. There was difficulty in getting the head out of acetabulum.

Patient died from shock the same night.

Case 5.—*Tuberculous osteitis of femur involving hip-joint.*

E. W., age 20, labourer, single, was admitted on May 29, 1911, complaining of pain in the left hip and thigh.

History.—Patient had been quite well up to five years previously. About that time he got a kick from a horse on the outer part of the left thigh about the middle. He worked for a year after this, but always seemed to drag that leg. Then the leg got stiff and he could not sleep at night. His doctor sent him to the Infirmary under Mr. Morison, and his leg was put in a Thomas splint (December, 1908). He did not stay in the infirmary,

but was an out-patient. Six months later he developed an abscess on the inside of the thigh, and later several others formed. About a year before admission the abscesses began to get better and dry up, leaving sinuses. A fortnight before admission, however, the leg began to ache, the pain going down its whole length. He had a great deal of pain at night.

On admission, he was thin, pale, and delicate looking. His temperature was 100·8° ; pulse 118 ; tongue slightly furred.

Signs.—The left hip-joint was stiff and there were a number of old sinuses on the inner side of the left thigh, some of which were discharging slightly. There was no rotation and no apparent flexion of the thigh ; talipes of both feet. Large bed sores on the shoulders and back.

X rays showed a tuberculous osteitis of the upper end of the femur with a definite arthritis of the hip-joint.

Operation (June 6, 1911), ileocolostomy.

January, 1914, patient no better.

Case 6.—*Tuberculous hip-joint abscess.*

W. T. S., age 34, superintendent, married, was admitted on July 14, 1911, with a discharging sinus on the hip.

History.—Two years previously he had pain in walking, and nine months later he had an abscess opened. From that date he had a great deal of trouble with discharging sinuses. On admission he was unable to move the right hip, which was flexed. At the knee the leg was also flexed and was inverted. There was a large abscess over the right trochanter which was pointing. The skin over it was red and œdematous.

Operation (July 18, 1911).—Abscess opened.

The after-progress was good.

July 28, 1911.—Present condition, spare. Discharging tuberculous sinus over the right femoral trochanter (greater). Right knee in position of flexion, and cannot be extended owing to contraction of the hamstring muscles.

Operation (July 29, 1911), ileocolostomy.—No gross evidence of tubercle in the peritoneal cavity.

Patient made an excellent recovery, the wound healing by first intention. When he left the hospital the sinuses over the trochanter were practically healed. He stated that for some time he had worn a spinal jacket. He was to continue to wear this.

Patient died of meningitis in July, 1912 (letter from his wife).

Case 7.—*Tuberculous sinus of foot (metatarsal).*

M. T., age 25, female, single, admitted to hospital on March 27, 1911, with a discharging sinus on the left leg between the knee and ankle. She was at the old Infirmary for a while and the sinus healed up. A sinus broke out four years ago between the middle toes. This had continued to discharge till admission. She had not walked since it started.

No chest trouble ; bowels irregular, sometimes costive and at other times very loose. She had lost some weight. At times she had severe pains at night in the left foot. After failure of surgical treatment patient was treated by Dr. Slade with tuberculin for twelve months without benefit.

On Admission.—Spare and anæmic. Pulse, temperature, and tongue normal.

Physical Signs.—The nail of the middle toe of the left foot was absent.

On the plantar aspect of the toe, at its junction with the rest of the foot, there was a stinking discharging sinus. The whole foot was œdematous and very tender. The skin of the whole foot was thickened and warty in appearance.

Operation (March 29, 1911), ileocolostomy.

On April 25, 1911, the wound on the foot had quite healed. Temperature had never varied from the normal.

Patient made a good recovery from the operation, and one month later she was completely healed up, and in six weeks walked about with a sound foot. Six months after the operation she was quite well, but she cannot now (January, 1914) be found.

CASE 8.—*Septic tuberculous psoas abscess.*

N. O., age 9, male, re-admitted on May 8, 1911, with a discharging sinus at the front part of an old wound over the right iliac fossa. The wound was very dirty and there was no dressing whatever upon it. The right trochanter was covered by granulations, there being no skin whatever.

At the first operation on March 11, 1911, a large tuberculous abscess in the right gluteal region and the right iliac fossa had been opened. It extended upwards apparently behind the right kidney. Skin entirely sutured up with silkworm gut. No drainage. On March 20, 1911, whilst the wound in the gluteal region was being dressed and the stitches removed, it suddenly broke open and a brown-coloured fluid in great quantity escaped. The wound was reclosed in two layers (secondary sutures).

Patient was sent out owing to an outbreak of scarlet fever. The wound was quite healed and the sutures were removed before he left hospital.

On re-admission there was a gluteal sinus which was dressed twice daily. On each occasion there was a large quantity of pus on the dressing. Although the general condition of the child improved, there was as much pus as ever, and another sinus formed at the posterior end of the belly-wall incision.

Operation (June 27), ileocolostomy.

After-progress.—The rectal tube was removed four days after the operation. The child was never well after its performance, and vomited frequently. On the fifth day after the operation he had definite signs of intestinal obstruction, there being visible peristalsis.

Operation by Professor Morison (July 1, 1911), median laparotomy.—Intestines very much distended. Obstruction due to passage of bulk of small intestine through the hole formed by the mesentery of the anastomosed ileum.

Child died next day.

Post-mortem showed caries of sacrum and septic infection of psoas and iliac fascial sheath, extending into the pelvis.

CASE 9.—*Tuberculosis of lumbar vertebræ and ileum.*

E. B., female, age 25, married, was admitted on May 31, 1911, with a discharging sinus in the lower part of the back.

She was quite well up to three years ago, when she had a baby; since then she has had pain in the back. Two years ago she noticed a lump in her back.

Operation (April 14, 1910).—Large lumbar abscess opened and scraped, and sewn up. No bone focus found. Sinus began to discharge seven weeks later.

December 27, 1910, sinus leading down to bare bone on right ilium scraped and injected with bismuth paste.

Re-admitted May, 1911. Cannot walk without help. Great pain in left hip. Has lost a good deal of flesh.

Signs.—Three small sinuses in lower and right part of back. Lumbar vertebræ tender and convex. Great limitation of power of flexion and extension of back.

Operation (June 10, 1911), ileocolostomy.—The general condition much improved after operation and whilst she was in hospital.

Died one year later at home.

CASE 10.—*Tuberculous osteitis of vertebræ and femur.*

S. T., age 18, male, sailor, was admitted on April 24, 1911. He had been quite well up to two years previously, when, whilst following his employment as a sailor, he began to have pain in the right hip-joint. It was worse when he walked about, especially in the morning, and it got better as the day wore on, until at night he was quite easy. He continued to sleep well. The pain was accompanied by a limp, which was worse at some times than others. Seven months ago a small lump came on the outer aspect of his right thigh in the upper part. This had got larger and larger. Four months ago an abscess burst in the same situation. He had lost 18 pounds in weight recently. He never had any pain at night. No cough; no other joint had been bad.

On admission, he was anæmic. Pulse, temperature, and tongue normal.

Signs.—He was extremely tender in the region of the right hip-joint. The right lower extremity muscles were wasted. The limb was in a position of flexion (marked by lordosis), adduction and eversion (slight only). On the outer aspect of the right thigh, septic discharging sinuses.

On April 5, 1911, bismuth paste was injected into two sinuses around the right hip-joint.

On May 6, 1911, an abscess in the lumbar region was opened under an anæsthetic, and about 8 oz. of odourless pus escaped. On May 11, 1911, the sutures were removed, and about 3 oz. of slightly purulent serum escaped.

Operation (May 13, 1911), ileocolostomy.—The mesenteric glands were enlarged, but Mr. Morison could not say that they were tuberculous. There was no evidence of tuberculous peritonitis. The belly wall was closed in layers.

On May 21, 1911, the patient was more cheerful and he had an excellent appetite, which before the operation had been very poor. His colour also was better.

When he went out of hospital he had very much improved in his general condition. He was much fatter, his appetite was excellent, and the sinuses were practically healed.

He was written to in February, 1913, but had gone, left no address, and cannot be found.

CASE 11.—*Tuberculous sacrum.*

A. K., age 17.

History.—For months had aching pain in the sacrum, worse at night. Two weeks before admission an abscess in the right gluteal region was aspirated.

Signs on Admission.—Fluctuating swelling over the right gluteal region with impulse on coughing. Hip-joint normal. No spinal rigidity. No pain on lateral pressure of pelvis.

Operations.—(1) Abscesses opened by house surgeon, scraped and sewn up. The pus was found to be coming through the sacro-sciatic foramen. (2) Cavity filled up and was drained by house surgeon. Area of necrosed bone felt in front of sacrum. Some pieces were scraped away. Sinuses continued to discharge and patient's temperature continued to be high. (3) May 20, 1913, ileocolostomy.

Patient's temperature remained normal for six days. General condition improved remarkably, and patient was able to take all his food well. Pus from gluteal wound ceased altogether.

Discharged from hospital June 17, 1913. Since admitted under Dr. Drummond.

January, 1914, patient only improved for a short while after the operation, and is now in a very poor condition, with all sinuses discharging as before.

CASE 12.—*Multiple tuberculous foci.*

M. H., age 10, admitted July 2, 1912. Suppurating sinuses in neck, in left groin, on left leg, on right thigh, on back.

Operation (July 11, 1912), ileocolostomy.

January, 1914, not any better.

CASE 13.—*Septic psoas abscess.*

W. C., age 26, butcher, married, was admitted on July 12, 1912.

History.—Patient was quite well until five months previously, when he noticed a swelling in the left groin. This gradually got larger, and about two weeks later it burst. It was cut by his doctor and syringed out, and had been dressed daily since. Patient had been in bed prior to coming to hospital. The abscess, said to have been a psoas, had not healed on admission. About two and one-half weeks previous to admission, while patient was in bed, an abscess began to form in the right lumbar region. This had gone on increasing in size and was very painful on admission. He looked ill and septic. His temperature was 101·8°; pulse 136, and soft; tongue moist and red.

Signs.—A large discharging siuus on the inner side of the left thigh. A swelling in the right lumbar region about 6 by 4 inches. The latter was slightly red and very tender. It fluctuated.

Operation (July 13, 1912).—Long curved incision well away from pointing area. Abscess cavity opened and an enormous collection of pus evacuated. The abscess appeared to originate from the dorsum ilii on the right side.

Operation (Aug. 15, 1912), ileocolostomy.—Patient was very ill after the operation. He hiccoughed frequently and occasionally vomited some green vomit, though not in large quantities. There was no distention. He complained of pain in the belly. The stomach was washed out twice. On the next day he was still hiccoughing at intervals and complained of pain in the belly over the wound. There was practically no vomiting—only a little brandy and milk he had taken. Stomach washed out twice.

On August 18, 1912, he vomited once in the morning, though only a small amount. Stomach washed out. He complained of pain at intervals and belched wind. Said he had passed flatus, but very little fluid had drained away from the tube. At 9.30 he vomited fæcal matter. The abdomen was rather more distended and coils of small intestine were quite visible, but no visible peristalsis. Slight rumblings were heard. The cæcum was not distended. A diagnosis of acute intestinal obstruction was made.

Operation (12 o'clock, Aug. 19, 1912). Mr. Richardson.—Sutures removed from abdominal incision and wound opened up. Free fluid in some quantity was present in the belly, but no pus. Tube through anastomosis and in small intestine for 9 inches exposed in the wound. The small gut was collapsed above it, with distended small gut (higher up) pressing against it and its mesentery. The tube was quite stiff and pointing more or less vertically. Collapsed gut was traced into a hole formed by the mesentery of the lower ileum and the tube above. Mesenteric sutures quite intact and no aperture present. A small piece of gut was found strangulated in a pocket formed by the tube and mesentery, the distended small gut packing it tightly in and helping to increase the strangulation. No gangrene. Obstruction reduced and belly wall closed in layers. Through-and-through silkworm interrupted sutures and a continuous catgut suture. Tube then withdrawn per rectum. Patient never recovered from the operation, and died four days later.

Post-mortem examination showed caries of sacrum and extensive retro-peritoneal suppuration.

CASE 14.—*Tuberculous sacro-iliac joint.*

R. W. B., age 23, chauffeur, single, was admitted on December 28, 1912, with a discharging sinus over the outer side of the right thigh at the level of the great trochanter.

History.—Two months ago patient had noticed pain on touching a certain place on the right hip. A swelling later appeared and the pain became worse. November 11, 1912, abscess opened at Liverpool Infirmary and a pint of fluid let out, after which the pain was relieved. During the previous two weeks before admission the pain had returned at the level of the iliac crest and the patient could not lie on the affected side.

Operation (Jan. 3, 1913).—Gluteal abscess opened and drained. Abscess over right sacro-iliac joint opened and bare bone felt.

Operation (Jan. 25, 1913), ileocolostomy.

He made a good recovery from the operation and the discharge from the wounds became less.

Patient was re-admitted in June, 1913, with the wounds still discharging. Operation, June 28, 1913. A sinus in the thigh was opened up. There was another found running deep to the femoral vessels.

August 18, 1913, patient left hospital for a sanitarium still discharging large quantities of pus. Temperature between 98° and 101°.

January, 1914, still unhealed.

CASE 15.—*Spinal caries.*

F. T., age 20.

History.—Spinal caries since age of 3. Six years before admission patient had an abscess in the right femoral region, which was incised and drained. Six weeks previously an abscess formed over the kyphosis.

Signs on Admission.—Large septic tuberculous abscess over the kyphosis. Small discharging sinus at upper part of right thigh.

Abscess opened, scraped, and closed by house surgeon.

Operation (Feb. 11, 1913), ileocolostomy.

After-progress.—Uninterrupted recovery. Scar on back completely cured when he went out.

January, 1914, improved, but scars discharging some pus again.

CASE 16.—*Tuberculous septic hip.*

J. M., age 9.

History.—Admitted with old tubercuIous disease of hip and abscesses. Abscesses opened, but did not heal.

Operation (Feb. 15, 1913), ileo-rectostomy.—"Beautiful Lane kink" present.

Seen April 14th. Very well; wounds clean. January, 1914, improved, but not yet healed.

CASE 17.—*Tuberculous gluteal bursitis.*

J. T., age 12, female, was admitted on December 2, 1912, with a discharging sinus on the right thigh.

History.—A week previous to admission patient had noticed a lump over the great trochanter, which caused her to limp owing to pain. Three days later the lump burst and pus came out.

Present Condition.—She was a cyanosed though healthy-looking child. There was no sign of specific disease. On the outer side of the right thigh were two sinuses discharging pus. A probe touched the bone. The hip-joint was quite natural.

Operation by Professor Morison (Dec. 21, 1912).—The sinus was opened up. No bone focus was found. TubercuIous gluteal lesion.

There was no improvement as a result of the operation.

Operation (Feb. 15, 1913), ileocolostomy.—Tubercuious mesenteric glands noticed.

February 20, 1913, the patient developed acute intestinal obstruction, and was operated upon by Mr. Richardson. A loop of small intestine was found adherent by a small spot to the parietal peritoneum. This was separated. There was a little lymph at this site.

March 2, fæces discharged from wound.

Patient gradually became weaker and died on March 9, 1913.

Post-mortem examination showed extensive suppuration in thigh and around hip-joint, but no involvement of bones or joints. The mesenteric and mediastinal glands were extensively infected.

CASE 18.—*Tuberculous glands.*

L. B., age 8.

Signs on Admission.—Unhealthy, anæmic child. Large mass of glands matted together in the anterior and posterior triangles of the left side of the neck. Some of these had broken down and formed discharging sinuses. In the left groin some large glands, hard and movable. Left external iliac glands enlarged. In the right groin some slightly enlarged glands. No other glands found. No signs of tubercuIous peritonitis.

Operation (Mar. 4, 1913), ileocolostomy.—Left groin glands removed at same time.

After-progress.—Wounds healed by first intention.

November 19, 1913, neck glands scraped by house surgeon; some improvement in condition.

January 14, 1914, not yet healed.

CASE 19.—*Tuberculous disease of innominate bone.*

A. P., age 26.

History.—Was in Old Infirmary in 1899, when Mr. Morison removed a considerable portion of the left side of the os innominatum subperiosteally to gain access to a psoas abscess, the result of hip-joint and acetabulum

disease. Treated in 1909 with bismuth and vaseline injections for unhealed sinuses. Albumen known to be present in urine since 1900.

Condition, March, 1913 : Numerous sinuses on left side around the hip in the groin. Most of the os innominatum seems to have regenerated.

Operation (Mar. 29, 1913), ileo-rectostomy.

After-progress.—Wound healed by first intention. Patient kept out on the balcony. Condition of sinuses improved, but when she left the sinuses in front still communicated with those on the outer side.

June 22, 1913, discharge much less ; sinuses not yet healed.

January, 1914, improved, but not yet healed.

CASE 20.—*Multiple tuberculous foci.*

J. H., age 10.

History.—First focus was in the upper part of the left leg. Since then abscesses have broken out all over both legs, right hip, and the neck.

Signs on Admission.—Red fluctuating swellings and sinuses at different parts of the body. No sign of bone disease.

Operation (May 10, 1913), ileocolostomy.

After-progress.—On leaving on May 21, 1913, patient looked much improved ; good appetite. Bowels moved normally and not very loose. Focus in the neck healing. Other foci showed very little difference.

Readmitted, July 21 1913. Septic foci unhealed. Barium sulphate given in a meal passed into the cæcum and remained there for one week, after which, though with great difficulty, it was removed by purgatives and enemata.

Operation (Aug. 1913), complete colectomy. Operation made easy by the fact that the transverse colon was not attached to the great omentum.

After-progress.—November, 1913, most of the sinuses healed except for one behind left knee and one in neck.

January, 1914.—Healed altogether. Quite well.

CASE 21.—*Tuberculous sinus.*

J. H., age 23, single, was admitted on October 24, 1913, with several tuberculous sinuses on the anterior surface of the right thigh which were discharging freely.

He was first admitted on September 19, 1905, and Mr. Rutherford drained a large abscess on the outer side of the right thigh. The incision never healed, and on October 10, 1905, Mr. F. Page amputated the right lower extremity at the hip-joint. He was extremely ill and nearly died from shock.

On admission on October 24, 1913, he stated the sinuses had never healed since the amputation. He looked ill. On the anterior aspect of the right thigh, on either side of the common femoral artery, were several tuberculous septic sinuses, which discharged freely and required constant dressing. Urine free from albumin ; sp. gr. 1019.

Operation by Prof. Morison (Oct. 28, 1913), ileocolostomy.—Appendix removed, as it was adherent to the cæcum and contained a stercolith. Stump invaginated by one purse-string suture of silk. Belly wall closed in layers. (Note : Cæcum tied down, not coming easily into wound.)

Nov. 24, 1913.—Sinuses practically healed.

Dec. 15, 1913.—Sinuses at back of and in front of right hip-joint discharging more. Injected with "Beck's paste." Free communication between each sinus.

Dec. 27, 1913.—Patient has been acutely ill, apparently from the effects of the injection.

Jan. 12, 1914.—Patient left hospital. Sinuses improved, but not healed.

CASE 22.—*Multiple rheumatoid arthritis.*

J. C., age 27.

History.—Rheumatic fever at 19, particularly affecting hands and feet. In bed three weeks; got quite well. Quite well until two and a half years ago, when the right wrist became painful and weak. Swelling followed, and in six months the wrist became stiff and useless. The fingers were also involved, so that she could not extend them fully. The left foot next was affected, and she became flat-footed. The right hand then was attacked and became fixed in a semi-flexed position, and then the left wrist. Occasional pains in shoulders and left side of jaw. Joints worse in summer. Patient has been pregnant twice, both babies premature.

Signs on Admission.—Some bad teeth. No enlargement of tonsils. No gross septic focus found anywhere. Right wrist ankylosed, deformed and painful. Second phalangeal joints in both hands swollen, painful, and ankylosed in semi-flexion.

Operation (May 20, 1913), ileo-rectostomy.—Tube could not be inserted through rectum into ileum.

After-history.—Immediately after operation patient said pain had gone, and could move the right knee much better. When she left hospital the right knee-joint could be almost fully extended. No pain in the joints since operation.

January, 1914.—No improvement.

CASE 23.—*Multiple rheumatoid arthritis—Resection of proximal half of the large bowel.*

H. F., male, age 29. In December, 1910, patient began to have pain in the feet. They swelled up, and in a short time he was obliged to take to bed. His knee joints became painful and swollen, and he had a similar condition in the finger joints and in the jaw.

He suffered from night temperatures, usually about 99° to 100°—sometimes 101°—and perspired freely. Vaccines were given over a considerable period, and patient went away to Harrogate for a course of baths, but was not benefited for any length of time. Other joints became involved, chiefly, in addition to those already mentioned, the hips and wrists. He found that by fasting and resting in bed his joints were improved, the swellings being reduced, but never entirely disappeared.

In July, 1912, he was able to get about with a stick, but only with difficulty, and about this time he underwent more vaccine treatment.

In January, 1913, he had an acute attack of pain in the joints, accompanied by a temperature of 102° to 103°. The case by this time showed multiple osteo-arthritis, the cause of which was never found. In addition he was greatly troubled with acne and boils, the latter being especially marked about the face.

On July 16, 1913, as there was no improvement, the proximal half of the large intestine up to the middle of the transverse colon was removed, including the lower six inches of the ileum. The latter was anastomosed to the transverse colon close to the point where it was divided.

On the day following the operation the joints were easier, and he could

remain in one position longer without feeling pain or stiffness. Four days after the operation, the knees were much improved; the creaking which had been so marked had almost disappeared, and the acne on the face and chest was also much better. Ten days after the operation he felt better. The knees and wrists were less swollen and he no longer felt 'night start.'

He left hospital on August 18, 1913, better, but not as well as he was during the first week after the operation.

January, 1914.—He is no better than before the operation.

CASE 24.—*Multiple rheumatoid arthritis—Resection of proximal half of the large intestine.*

Miss S. L., age 34. Five years ago she noticed that her finger joints began to swell up and became painful. Shortly after, the right shoulder became similarly affected, and later all her joints caused her the same trouble. Three years later her parotid glands became swollen, causing her pain on eating. For she last two years the had not been able to do any work on account of her multiple joint trouble.

On admission she looked thin, and her skin was brownish in colour. She had no cough and no focus was found to suggest a primary cause. She had previously had all her teeth removed. Both parotid glands, the submaxillary and sublingual glands were swollen, and she could open her mouth only a little. Her shoulder-joint movements were very much restricted: also those of the metacarpo-phalangeal joints, and there was marked deformity in her fingers. The knee-joints could not be fully extended, but swelling was not marked. The ankle-joints were very much swollen, but the movements were fairly free.

On August 27, 1913, the proximal half of the large intestine was removed through a middle line incision, a lateral anastomosis being made between the lower end of the ileum and the transverse colon.

Patient stood the operation well and suffered no shock. Four days later she felt relieved, and the parotid tumours had almost entirely disappeared. Her sister stated that she looked better than she had done for two years.

Improvement, which was also noticed in her joints, lasted, however, for only a short time, for within ten days of the operation her rheumatism returned, and her salivary glands once more became swollen and painful. She left hospital two weeks after the operation not much better.

January, 1914.—No better for operation.

CASE 25.—*Chronic constipation—Ileocolostomy.*

Mrs. M. V., age 34. Since the age of 17 she has had to take purgatives, and could never get a natural action of the bowels. During this time she frequently had to resort to enemata, and even then no action of the bowels followed. She easily got tired and suffered frequently from headaches. About the same time she suffered from what was thought to be an ulcerated stomach, and on four occasions vomited blood.

The patient, a thin woman, had a dry skin which was brownish in colour. Her abdomen presented no abnormal physical signs, with the exception that succussion over the cæcum could be elicited.

On May 7, 1913, a short-circuit operation was done, the lower end of the ileum being joined to the pelvic colon after Lane's method. There was no Lane's kink of the small intestine, and the appendix was without pathology.

Patient made uninterrupted recovery, and left hospital eighteen days after operation.

After leaving hospital she improved for a short time, but soon her constipation trouble returned, and a letter from her doctor, written five months after the operation stated that she was by no means cured of her constipation, and that she had still to resort to the use of glycerine enemata to get her bowels moved. She was at that time stated to be much better in her general health.

January, 1914.—Her doctor reports much better; has a normal stool daily.

Observations on the Passage of Food in Patients after Ileocolostomy.

Hamilton Drummond, F.R.C.S., Edin.

The object of this investigation on eight cases of ileocolostomy was to show: (1) By which route food travelled after this operation before leaving the body; and (2) The length of time that elapsed before the meal was evacuated. In all eight cases the anastomosis had been made at a point as low down in the pelvic colon as possible. The difficulties of observing these cases frequently in the *x*-ray Department prevented as full an investigation as we would have liked, but enough information has been gained to demonstrate several important points. A detailed account of each case, stating the different radiographic readings, is appended.

Of the eight cases investigated, seven were operated upon for extensive tuberculous joint or bone lesions, and the eighth for multiple osteo-arthritis. These examinations were conducted in some cases after two years had elapsed.

It is interesting to note that after a barium meal the metal was seen to travel to the cæcum with one exception in every case examined. In that case it was traced as far as the splenic flexure, but no further.

Case 16.—A boy, operated upon not long before, age 9, was given a cup of bread and milk with 3–4 oz. of barium sulphate added, followed two hours later by a plate of minced meat containing another 3–4 oz. of barium sulphate. Five hours after the second meal an *x*-ray plate showed the barium in the stomach and small intestine. The large intestine was empty.

Twenty-four hours after the second meal had been given, an *x*-ray picture showed barium in the rectum, the pelvic colon, and in the lower end of the small intestine, which, apparently adapting cæcal functions, had become enormously distended. (A similar view of this portion of the gut was seen on another occasion when a bismuth enema was given.)

The next examination was made forty-eight hours after the second meal, and it was found that there was still some barium in the small intestine, though nothing like so much as at the last examination. The pelvic colon and rectum showed a fair quantity of the salt, and the iliac, descending and transverse colon, up to the middle of its right half, all contained barium.

Seven hours later (forty-five after the second meal was given) another picture was taken. The pelvic colon and the rectum, the iliac and the descending colon contained the salt, but the transverse colon was free except for a large mass situated just on the distal side of its centre. There was another similar mass in the cæcum. The transverse colon was markedly U-shaped, its whole lumen being plainly seen filled with gas. This sagging down may be accounted for by the heavy salt lying in the middle portion, and the upright posture (as the patient was going about during the seven hours) might further assist.

Seventy-two hours after the second meal, the bulk of the barium was seen to be in the rectum, but there were two smaller distinct patches in the transverse colon, which had lost its U-shape since the previous examination made seventeen hours before.

Frequent further examinations showed little change during the next few days, and except for a patch in the transverse colon, it was not until six days after the first meal had been given that all the salt had disappeared from the colon.

Case 22.—Mrs. C., age 27. Two and a half ounces of barium sulphate was given in bread pudding. On examination, twenty-four hours later, it was seen abundantly in the rectum, the iliac colon, and descending colon up to the splenic flexure. The transverse colon for the greater part contained gas only, but the salt was well seen in the cæcum and ascending colon.

The patient was not *x*-rayed again until fifty hours later, when it was found that the whole of the large and small intestine were empty of the salt.

Case 11.—A. K., male, age 17. Two ounces of barium sulphate mixed with a plate of meat were given, followed twelve hours later by a solution containing 1½ ounces of barium sulphate, potato flour, and almond oil, made up to a pint.

On *x*-raying the patient, twelve hours after the second meal, the metal was found to be in the rectum and pelvic colon, being almost entirely limited to the pelvis.

Twenty-four hours later (forty-eight hours after the first meal was given), the metal was seen to be entirely limited to the large bowel. It occupied the whole of it from the splenic flexure to the cæcum. The pelvis and small intestines being empty. Twenty-two hours later it was seen to be in the transverse colon and cæcum. A week later it was still in the cæcum and the ascending and transverse colons.

Case 12.—M. H., male, age 10. One ounce of barium sulphate in bread and milk was given.

Sixteen hours later it was seen to be in the small bowel.

Twenty-one hours after ingestion of the meal some was still in the small bowel, and some had reached up to the splenic flexure and the transverse colon.

In forty-five hours the whole of the large bowel, including the cæcum, contained the salt. There was none in the small bowel.

This patient had to be sent home, and there was no opportunity to observe how long the meal took to leave the body.

Some weeks later he was re-admitted to hospital and another meal of barium sulphate, 1½ ounces in minced meat, was given.

The patient was examined forty-eight hours later, and the salt was seen to be in the pelvis and the descending colon.

A second observation was made seventy-two hours after the meal. This showed that it occupied the splenic flexure and all the large bowel proximal to this point, the cæcum being especially full.

Case 16.—J. M., age 9, male. A meal of barium chloride potato starch (half a pint) was given. Inability to get at the *x*-ray apparatus prevented the patient from being *x*-rayed until twenty hours after the meal. It was then found that the salt occupied the transverse colon up to the hepatic flexure, and the whole of the remainder of the large intestine distal to this point, including the rectum (*Plate XXVII*A).

Four hours later the salt was seen to have left the hepatic flexure, but it occupied the remainder of the transverse colon.

Fifty hours after the meal was given, the solution was seen to be in the rectum only. The remainder of the large bowel was quite empty.

Although no bismuth was seen in the cæcum at any time, experience leads us to believe that if the patient had been examined before the twentieth hour of ingestion, the solution would have been visible in the region of the cæcum.

Several days later, when all the bismuth solution had been evacuated, a meal of bread and milk was given, thoroughly mixed with 1½ ounces of bismuth oxy-chloride. On examination, twelve hours later, the whole of the large bowel up to the splenic flexure was seen to contain bismuth solution.

Sixteen hours after the first meal was administered, a plate of minced meat with one ounce of bismuth oxy-chloride was given, and two hours later an *x*-ray picture showed the solution to be in the coils of the small intestine and in the distal half of the large intestine down to the rectum. Ten hours after the second meal was given, the bismuth was seen in the ascending and transverse colon up to the splenic flexure, and faintly in the cæcum. The descending colon was empty and the iliac and pelvic colons along with the rectum were filled with bismuth residue (*Plate XXVII*B).

Seventy hours after the second meal, bismuth was seen to be in the cæcum, ascending colon up to the hepatic flexure, and slightly in the proximal end of the transverse colon, while the remainder of the large intestine was quite empty.

Five days after the meal had been given there was still a quantity of metal present in the transverse colon. Owing to the pressure for beds, he could not be kept in hospital for further observation.

Case 3.—R. B., age 8. Patient was given a meal of minced meat containing one ounce of barium, followed four hours later by one ounce of barium sulphate in bread and milk.

After twenty-four hours, the barium solution was seen in the pelvis and reaching the pelvic colon. On the second day after the meal had been administered, the solution was seen in the descending colon up to the splenic flexure, and seventy-two hours after the meal all the barium had left the body. There was no subsequent opportunity of examining the patient.

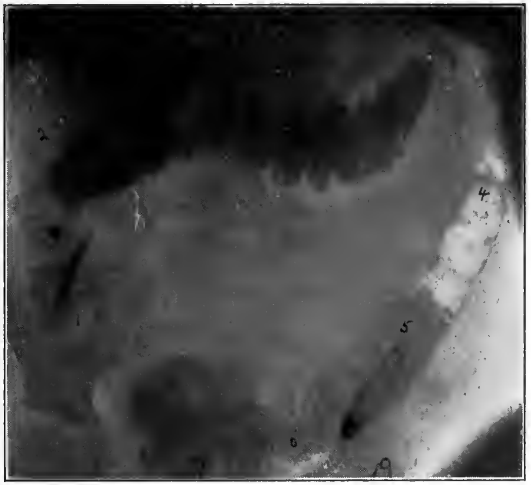
Case 19.—A. P., female, age 26, was given a meal consisting of 1½ ounces of barium sulphate in mince meat.

On examination twenty-four hours later, it showed in the pelvis, but the major part was in the descending and transverse colons. The splenic flexure was seen on the plate to be empty, containing gas only. None of the barium was noticed in the cæcum or proximal half of the transverse colon.

PLATE XXVII.

A

ILEOCOLOSTOMY. J. M. 20 hours after a bismuth meal. Bismuth seen in transverse colon, and all of the large intestines beyond this point. 1. Cæcum. 2. Hepatic flexure. 3. Splenic flexure. 4. Descending colon. 5. Iliac colon. 6. Pelvic colon. 7. Rectum.



B

ILEOCOLOSTOMY. J. M. Plate taken after two consecutive meals—16 hours' interval—10 hours after second meal. Bismuth seen in cæcum, ascending and transverse colon. The descending colon is seen filled with gas; salt shown is in iliac pelvic colon and rectum. 1. Cæcum. 2. Hepatic flexure. 3. Splenic flexure. 4. Descending colon. 5. Iliac colon. 6. Pelvic colon. 7. Rectum.

PLATE XXVIII.

A

ILEOCOLOSTOMY CASE. No. B8793. A. P. (Barium meal six months after the operation.) Shows barium in cæcum and ascending colon; also in pelvis. 1. Cæcum. 2. Hepatic flexure.

B

ILEOCOLOSTOMY CASE AFTER BARIUM MEAL; B9807. J. H., age 23. Photo taken four days after a meal containing 1½ ounces of barium sulphate was given. It shows the salt present in the cæcum and ascending colon up to the hepatic flexure and commencement of the transverse colon. 1. Cæcum. 2. Hepatic flexure. 5. Iliac colon. 7. Rectum.

In forty-eight hours the salt was seen in the distal half of the transverse colon, the ascending colon, and cæcum.

Seventy-two hours after the meal had been given, little change from the previous examination was noticed, except that the salt was more spread out in the proximal half of the large intestine.

Another meal, consisting of potato flour and an ounce of bismuth oxychloride was made into one pint of solution and given.

Twenty-four hours after the second meal (three days after the first meal) a large amount was seen in the pelvis, and in the cæcum up to the middle of the transverse colon.

Forty-eight hours after the second meal (four days after the first meal), on *x*-ray examination the salt showed plainly from the cæcum up to the splenic flexure, the greater part of the salt being in the cæcum and ascending colon (*Plate XXVIIIA*).

Five days after the second meal, on *x*-ray examination, the cæcum and ascending colon still contained masses of barium salt, and also the transverse and descending colon.

Case 21.—J. H., age 23. Patient was given a meal of bread and milk containing 1½ ounces of barium sulphate,

Twenty hours later it was found to have left the small intestine and to occupy the distal half of the large bowel up to the middle of the transverse colon.

Twenty-six hours after the meal, an *x*-ray examination showed the barium to be more spread out. It had extended to the hepatic flexure, and the appearance of it differed from the *x*-ray picture seen six hours previously, in that there were separate masses and not one continuous shadow.

In forty-four hours the meal had extended to the cæcum; the transverse colon still showed a quantity of the solution. Four days later the salt was seen to be almost entirely in the cæcum and ascending colon, which were full, and the proximal half of the transverse colon contained a small quantity. The shadow in the cæcum to the hepatic flexure was clearly shown (*Plate XXVIIIB*).

During this time the patient was having ordinary diet and had a good appetite.

On examination a week after the meal was given, there was still a quantity of barium in the cæcum and ascending colon. The shadow, however, was not so marked as on the previous occasion. The patient was not examined again for a week (two weeks after the barium meal), when it was found that there was still a thick definite coating of salt in the cæcum and the ascending colon, but nowhere else.

Summary.

The operation of ileocolostomy was performed in 23 cases; in 21 for septic tuberculosis, in 1 for chronic multiple osteo-arthritis (Case 22), and in 1 for chronic constipation (Case 25).

Complete colectomy was done in 1 case after failure of ileocolostomy (Case 20).

Partial colectomy (Mayo method) was performed in 2 cases (multiple osteo-arthritis) (Cases 23 and 24).

Deaths.—Of the 26 cases, 3 died as the result of operation, all of the deaths being in the ileosigmoidostomy group.

A gross mistake in the technique was responsible for one of the deaths. It occurred from intestinal obstruction due to strangulation through the unclosed mesenteric opening left by joining the ileum and lower bowel (Case 8). In all cases since I have carefully closed this trap. The second death, also from intestinal obstruction, was due to using too stiff a tube in the ileum, and was avoidable (Case 13). The third, also due to acute intestinal obstruction, was caused by a trifling parietal adhesion and secondary volvulus, and was unavoidable (Case 17). A diagnosis of intestinal obstruction was not made till too late for operation in the first case. In the last two the abdomen was reopened and the local conditions were easily remedied, but the patients were too feeble and ill to respond.

Results.—Of the 18 cases operated upon for septic tuberculosis which survived, 5 are since dead. Of the 13 cases now alive, 2 cannot be traced. Of 11 cases followed up to date, 4 are no better, 1 no better after ileocolostomy is cured after colectomy (Case 20). Of 6 cases benefited by the operation, 3 show complete healing of the sinuses and up to date are in good health ; 3 are improved in health, but still have discharging sinuses.

The cured cases are :—

Case 7.—M. T., age 25. Tuberculous septic foot discharging for four years. Completely healed one month after operation.

Case 11.—M. W., age 15. Old hip-joint disease with discharging sinuses. Healed three weeks after operation.

Case 21.—T. H., age 7. Old tuberculous hip with infected abscess. The wounds healed within two months of operation and two years later remained healed.

X-ray Examination.—After the operation, in every case examined the contents of the small intestine on reaching the colon travelled backwards, and in all except one were seen to reach the cæcum. In the exceptional case it was not seen beyond the splenic flexure (Case 14).

In all cases complete evacuation of the colon was delayed by the operation.

The last portion of the ileum, immediately above the anastomosis, tends to become dilated and to form a fæcal reservoir.

SURGICAL TEACHING.[1]

(*The Clinical Journal*, November 11, 18 and 25, 1914.)

Surgery has developed within recent years into so large a subject that it is now impossible for anyone to be a master of the whole. The result of this has been that its various departments each tend to become an independent study, that specialities have been formed in all of them which are of sufficient importance, and that major operations are reserved for those who are specially skilled in their performance.

The conscience of American surgeons has been the first to be aroused to the practical importance of these facts; the steps they have taken to put their own house in order are well known to all of you, and they cannot fail to influence medical practice all over the world. Their action will also appeal so strongly to an educated and enlightened public that the only danger to be feared is that we may be asked why—knowing what we did—nothing had been done sooner to guard its safety and guide it to proper sources for treatment.

What I have said may be taken as an indication of the need for and approval of specialities, and so it is, but not as they are frequently taught and practised in Britain at the present time. With the exception of the eye and the teeth, I can conceive of no legitimate surgical speciality, and those require a good general medical and surgical education if dangerous mistakes are to be avoided. Every other operating specialist should have been an experienced and capable general surgeon, and should have developed the speciality he adopts by his natural or acquired capacity for it. Even then he will only be of the highest use if he maintains his interest in, and knowledge of, general surgery.

This all means that surgery has now arrived at a position beyond the reach and power of the family doctor, and that, unless in exceptional conditions, he should not, in the interests of his patient and of himself, perform surgical operations. If there are any here who do not accept this view now, it is safe to prophesy that the time is not far off when they will.

You may ask what has all this to do with the subject of my address—Surgical Teaching? It is this: That the teaching of those students who are to become practitioners should be different in character and more limited in aim than that intended for developing surgeons. It should be limited to teaching them essential truths and diagnostic and prognostic principles, so thoroughly as to make it

[1] The address in Surgery at the Annual Meeting of the Canadian Medical Association, St. John's, N.B.

difficult for them to forget, as they usually do soon after graduation, most of the information they now so painfully acquire. What I regard as essential truths I will endeavour to convey later on.

Then the demand for post-graduate teaching is increasing as knowledge grows, and is going to increase still further in the future. I hope everyone here has read what Sir William Osler has said of this. It is to the effect that, if a doctor is cut off from a medical centre and is isolated from his colleagues, a gradual deterioration, which he cannot recognize, goes on in his medical knowledge, so that at the end of five years he requires one month of hospital teaching to restore him; at the end of ten years it takes him one year in a hospital to pick up again; and at the end of twenty years he is in a hopeless plight. Thirty years ago progress in medicine was so slow that a good knowledge once acquired sufficed for a lifetime. As this is no longer true the changed conditions are explained.

No one who has thought about the subject doubts that the welfare of the public depends more upon the efficiency of the practitioner than upon any consultant or specialist, however distinguished he may be. The family doctor is consulted before anyone else, and the fate of a patient is more often decided by his action, or inaction, than by any other factor. Striking examples of this are to found in (1) The importance of early recognition of malignant growths and ulcers, for which the only hope of cure at present is to be found in operation while the disease is still local; (2) The abdominal emergencies, such as acute appendicitis, ruptured stomach or intestine, and acute cholecystitis, before septic peritonitis has decreased their chance of recovery to a fraction of what it would have been earlier; (3) Acute intestinal obstruction, in which the prognosis may be said to depend upon the time after onset that operation had been performed, and (4) Intra-abdominal hæmorrhage from injury, ectopic gestation, etc., because arrest of hæmorrhage before the patient's general condition has become serious will almost certainly be followed by recovery, whereas a late operation is likely to be unsuccessful. Post-graduate teaching for the medical practitioner is consequently one of the most important medical movements of to-day.

The education of a surgeon is always incomplete if he is not a good anatomist, physiologist, and pathologist to start with, and continues to be so to the end, and it is only by those who will take the trouble to attain and maintain this knowledge that any real surgical advance can be made. It would be impossible to offer a better example of this than is to be found in my predecessor, Dr. Crile. The days when surgery was a mere handicraft are past, and to be able to operate well, though a useful accomplishment when properly applied, may make a man a curse instead of a blessing to the community in

which he practises. With the foundations I have suggested a long apprenticeship under skilled masters is still necessary to anyone who aims at becoming himself a master in surgery, and post-graduate visits to surgical clinics are as essential to him as post-graduate courses are to the medical man. The whole surgical world will follow with keen interest the conduct of the American surgeons in their appointment of "efficiency committees" for their hospitals, the results of their inquiries into the immediate and remote results of operations and operators, and their honest and strenuous endeavour to lift surgery on to a higher plane. If they succeed, and there is every reason to believe they will, the dawn of a new surgical era is in sight. It is not, however, my intention to say anything more of surgeons.

The surgical teaching of which I intend to treat now concerns medical students, and will only distantly relate to the most important part of it all—hospital practice.

The revolution in surgery brought about by Lister turned surgical attention so strongly to bacteria and their doings, that a considerable number of surgical textbooks, disregarding the practice of their forefathers and the introduction to surgery by inflammation, have, as their first chapter, one on bacteria. This was a good influence when the importance of the germ theory of disease was in doubt. It is so no longer, and the time has come, I think, when we should return to our old practice of considering inflammation as the first chapter of surgery, because when that is understood more than half of surgical theory and practice becomes intelligible. Another reason is that we now know that the importance of bacteria in surgery has been somewhat overrated. Bacteriologists tell us that our most perfect technique fails to keep organisms from wounds, that asepsis by our present methods is not attainable, and they may advise us of the presence of malignant organisms in wounds when we see that no harmful effect has been produced. Up to the present we have only arrived at the stage of surgical cleanliness, though our aim has been and still is a perfect asepsis. More and more we are coming to appreciate the condition of the patient and the vital resistance of his tissues, seeking to derange neither and to conserve both.

I now wish to give a few examples of the method I have evolved after teaching surgery to students for twenty-five years. Anyone interested will be enabled to follow this up, since Mr. Saint is helping me to rewrite a second edition of my book, *An Introduction to Surgery*, and I wish here to express my indebtedness to him for suggestions.

Examples of Essential Surgical Principles.

Inflammation.

The chief reaction of the tissues to any irritant are: (1) Vascular changes; (2) Cellular proliferation.

A reaction sufficient to cause redness, heat, pain, swelling and loss of function is called inflammation.

When the vascular phenomena predominate the inflammation is acute.

Chronic inflammation has, as its chief characteristic, cell proliferation (granulomata).

Tissue irritants are either (1) Non-infective, or (2) Infective. The non-infective include such agencies as mechanical, electrical, thermal, *x*-ray, and chemical injuries. The infective are micro-organisms.

1. The inflammation which results from reaction of the tissues to non-infective irritants, has first to deal with effects of the damage, and second to bring about healing. (It has seldom to do with the cause, since the agent producing the injury is generally removed.) The amount of the inflammation is here a response to the *quantity* of the irritant, and, as its concern is limited to repair, I have been accustomed to describe it as ' physiological ' inflammation.

2. The inflammation resulting from micro-organismal infection has, as its first function, to deal with the cause (germs), second with the damage effected, and then to bring about repair. The disturbance caused is a response to the *quality* of the irritant, and the result depends chiefly upon this factor. I have therefore been accustomed to designate it as ' pathological ' inflammation.

The aim of both is natural cure.

Repair.

Repair of all wounds is brought about by cellular proliferation (formation of granulations).

In a wound of the soft parts healing by ' first intention,' or in a fracture without displacement, the amount of granulation tissue formed is limited to a minimum; in either case when a gap is present a sufficient amount of granulation tissue is formed to fill it. The round cells forming the granulation tissue, and derived from the active reproduction of cells of the surrounding tissues, become converted into fibroblasts, then into fibrous tissue (scar in the soft parts) or bone.

The Effects of Circulatory Disturbance.

The important rôle played by circulatory disturbance, perhaps because it is so simple, does not at present receive the attention it deserves. I have pointed out (*Brit. Med. Jour.*, Oct. 28, 1911) the

PLATE XXIX.

MARTIN'S BANDAGE APPLIED FOR SEPTIC WOUND OF FOOT WITH CELLULITIS.
Whole limb below bandage engorged and thickened as a result of the application.
Complete recovery on removal.

PLATE XXX.

VOLKMANN'S ISCHÆMIC CONTRACTION.
"Fibrosis" from too tight bandage.

importance and prognostic significance of it in cases of peritonitis, and later I will draw attention again to it as the most important feature in strangulation, volvulus and inversions. Faith in toxins and toxæmia, and in the results of their action, of which at present we know very little, has prevented investigation of less difficult problems.

The effects of circulatory disturbance brought about by mechanical agencies are well enough known, and have been observed from time immemorial in the limbs after the application of a too tight bandage. If such a tight bandage has been applied to the arm or leg (*Plate XXIX*), the removal of the constriction may result in: (1) Transitory hyperæmia; (2) Fibrosis (*Plate XXX*) (Volkmann's ischæmic contraction); (3) Partial destruction (ulceration, sloughing); (4) Gangrene (total destruction).

The local terminations are the same as those of a streptococcal infection of the arm.

Terminations of Inflammation.

From the familiar boil most important lessons in surgical pathology may be learned. The etiology, pathology, symptoms, diagnosis, prognosis and treatment of inflammation everywhere can be understood and appreciated after the careful study of a boil. The terminations of it are those of inflammation elsewhere.

1. The red, hot, painful swollen spot may quickly disappear and leave no trace: RESOLUTION.

2. It may threaten mischief, and then subside, leavin a permanent firm nodule of fibrous tissue (blind boil): FIBROSIS (sclerosis in the bones).

3. It may suppurate and slough (discharge a core); ulceration, sloughing in the soft parts, caries and partial necrosis in bone: PARTIAL DESTRUCTION.

4. It may develop gangrene (facial carbuncle) and cause death; gangrene of the soft parts, necrosis in bone: TOTAL DESTRUCTION.

General Considerations concerning Inflammation.

In considering every case, remember that causes are predisposing and exciting, that results are general and local, and that either may be more important than the other in each particular example.

Application of General Principles concerning Inflammation to Special Organs.

Special study of each individual organ or part of the body has hampered rather than helped surgical pathology, on which a proper understanding of the problems to be solved chiefly depends. In

every organ and in each part of the body the essential changes in inflammation are the same, anything special can be readily appreciated when these are understood. When such knowledge is applied to a condition like pancreatitis the difficulties and doubts surrounding the literature concerned with it vanish. Many varieties are described: cirrhotic, phlegmonous, suppurative,[1] gangrenous, hæmorrhagic, and others, making confusion worse confounded. An inflamed pancreas, like a boil, may undergo resolution, develop fibrosis, suppurate or slough, or become gangrenous. (See also *Figs.* 25, 26, 27, 28, and *Plates XXXI, XXXII, XXXIII.*) The only special type is the hæmorrhagic, and that is probably the result of auto-digestion of the blood-vessels, and accidental.

Fig. 25.—Appendicitis. Fibrosis—obliteration.

Inflammatory Fever.

General disturbances in inflammation are grouped together as fever. Special types are: Sapræmia (toxic), septicæmia (bacteria in the blood), pyæmia (the deportation of emboli from a septic focus).

Extension or Spread of Inflammation.

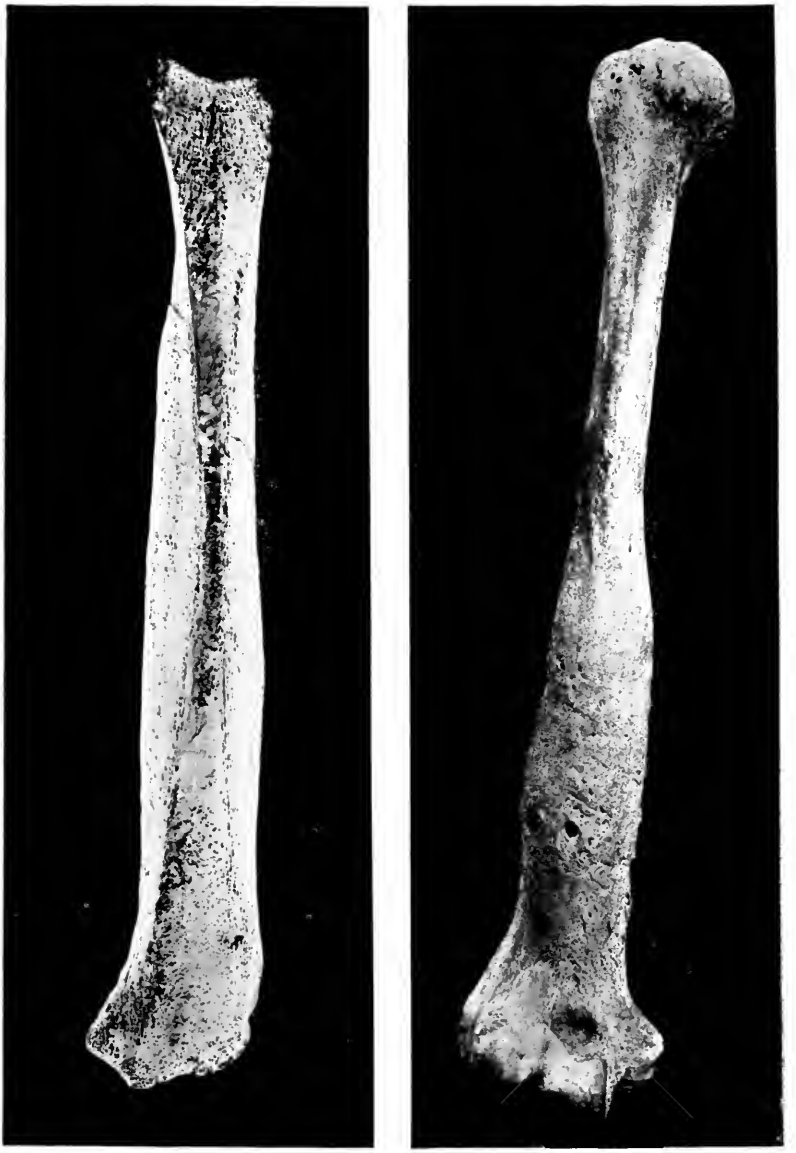
Extension of the process in inflammation, as in malignant growths, occurs by (1) continuity; (2) contiguity; (3) by lymphatics; (4) by blood-stream. For example, in appendicitis the inflammation may extend (*a*) directly to the cæcum and appendix mesentery; (*b*) to the contiguous omentum and coils of intestine; (*c*) to the lymphatics and cellular tissue; and (*d*) to the ileo-colic veins and liver.

Cancer of the rectum may extend (*a*) up and down the bowel; on either side, into the levator ani muscles and ischio-rectal fossæ; in front, to prostate and bladder; behind, to sacrum and nerves; above, to peritoneum; (*b*) to adjacent coils of small intestine lying in pelvis; (*c*) to lymphatic glands in mesentery; (*d*) to liver by blood-stream.

For several years this has been my teaching, and till this year I had found nothing resembling it in surgical literature. Recently, in reading some old dissertations belonging to the Royal Medical Society of Edinburgh, I discovered that the late Professor Syme, in the year 1821, when he was 42 years of age, said of bones: "Although

[1] Suppuration and abscess formation, though so important surgically, are not essentials of either pyogenic or tuberculous infection.

PLATE XXXI.



SCLEROSIS OF BONE
(Corresponds to Fibrosis).

PLATE XXXII.

CARIONECROSIS OF BONE
(Partial destruction).

PLATE XXXIII.

NECROSIS OF BONE
(Total destruction).

the diseases of bones may appear to a careless observer almost endless and complicated beyond the powers of description, they are found upon investigation to be few and extremely simple. They are all preceded by inflammation, and are the terminations of this action. . . . The most gentle action carried on in bones is the adhesive inflammation or that which provides for the union of simple fractures."

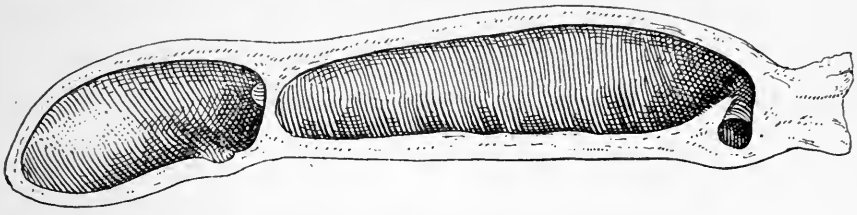


Fig. 26.—Appendicitis. Fibrosis and stricture.

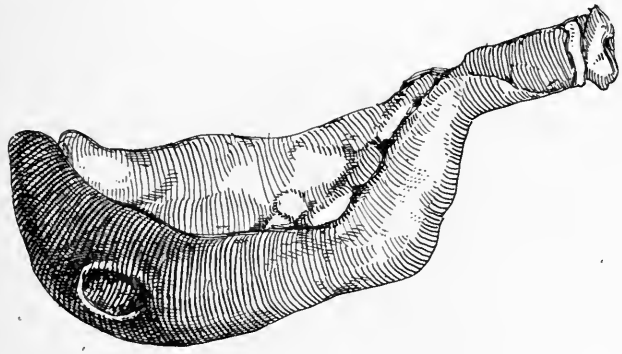
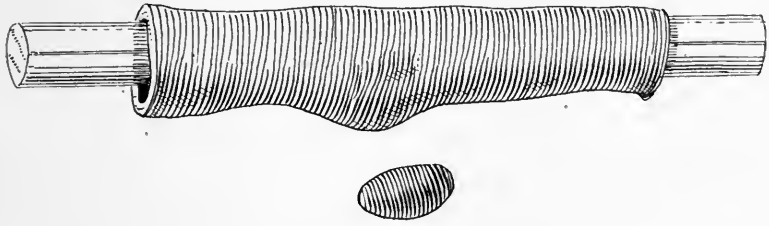


Fig. 27.—Appendicitis. Partial destruction.



Stercorolith.

Fig. 28.—Appendicitis. Total destruction.

This simple teaching has been departed from since that day, to the great misfortune of students, and to the detriment of surgery. By recognizing a non-infective and an infective cause for inflammation the difficulties of fitting in Syme's statement with present knowledge are surmountable.

Joints: General Considerations.

Diseases of the joints are a bugbear to students as usually taught, but when they learn that, for surgical purposes, in all joints four structures are to be considered: (1) bone, (2) synovial membrane, (3) cartilage, and (4) ligaments; that disease commences only in bone or synovial membrane, not in the ligaments or cartilages; and that the diseases are almost entirely due to inflammation with its usual etiology, pathology, symptoms, diagnosis and terminations, they soon acquire a satisfactory grasp of the subject.

Arthritis of all large joints of the extremities passes with variable rapidity through three clinical stages:

1. In the first the limb is held *voluntarily* by the muscles in the position of greatest ease.

2. In the second the limb becomes fixed *involuntarily* by contraction of the muscles. This stage commences with night startings and the strongest muscles win the battle.

3. In the third stage there is deformity from destruction of the joint, especially the ligaments and bones, and this is characteristic for each joint. Applying this to the hip-joint, which occasions perhaps the greatest difficulty of all, we find:—

In the first stage, that of voluntary contraction, the limb is flexed and abducted—the position of ease. Abduction necessitates, in order to make the limbs parallel, the pelvis on the diseased side being tilted downwards, and there is consequently *apparent lengthening* (*Fig.* 29).

In the second stage, that of involuntary muscular contraction, the limb is flexed and adducted by the stronger adductors. Adduction necessitates, in order to make the limbs parallel, the pelvis on the diseased side being tilted upwards, and there is consequently *apparent shortening* (*Fig.* 30).

In the third stage, destruction of the bones and ligaments frequently ends in a dorsal dislocation, with deformity and *real shortening.*

Surgical Definitions under Inflammation.

Definitions may be of considerable use in teaching, because they make students think and give them pegs to hang their thoughts upon. For example:—

A *sinus* is a tubular ulcer with something at the bottom of it preventing healing.

A *fistula* is a tubular ulcer, or remains of one, which opens on the skin externally and a mucous canal internally, or forms a communication between two mucous canals.

An *abscess* is a cavernous ulcer containing pus.

An *empyema* is pus in a preformed cavity.

Hip Deformity Illustrated by Wooden Matches.

First Stage.

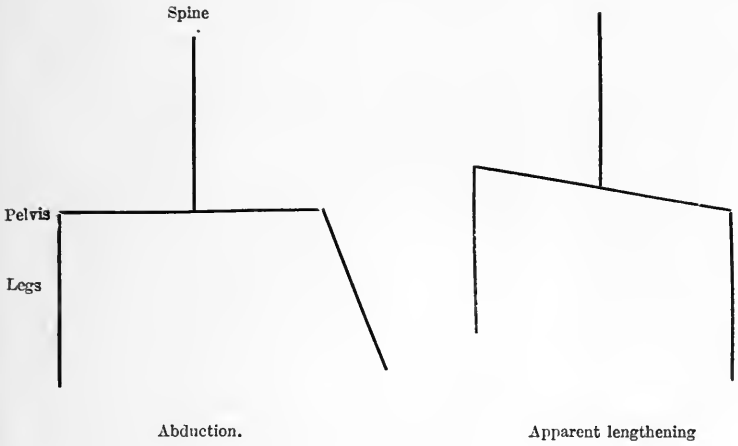


Fig. 29.

Second Stage.

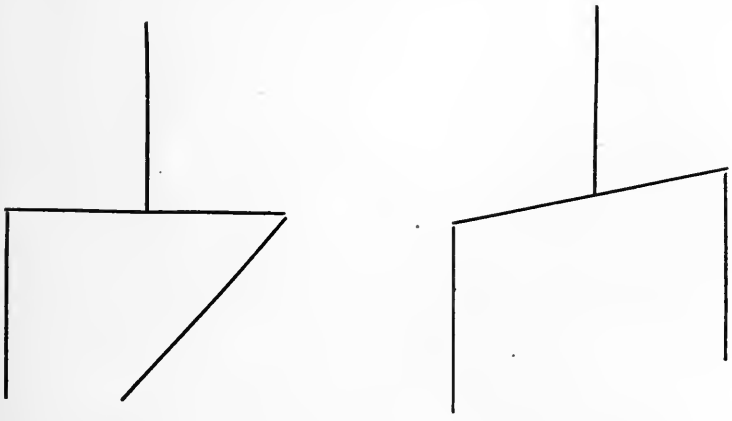


Fig. 30.

Ulcers.

My teaching with regard to ulcers is that they are the result of defective blood-supply.

In simple, as distinguished from malignant, ulcers the defective blood-supply causing them is nearly always due to inflammation, so that the predisposing causes of ulcer are those of inflammation, and the exciting cause infection by organisms, usually pyogenic or those of tubercle and syphilis.

Dangers common to all Wounds are Shock, Hæmorrhage, and Sepsis.

The use of a knowledge of general principles is emphasized by a story Mr. Saint told me of one of his students, a clever, but somewhat idle young man. In his final examination one of the questions asked was: "What are the symptoms produced by and the dangers following a penetrating stab wound of the chest-wall in the mid-axillary line?" The student knew nothing of it, but proceeding on general lines he first described the symptoms produced by shock, then he followed with hæmorrhage from the lung and from an intercostal artery, and ended up his answer with the conditions resulting from sepsis in the wound, in the pleura, and in the lung. He knew that the dangers of every wound arose from shock, hæmorrhage, and sepsis, and applied this knowledge to the case. He did not know that the escape of air from the lung might cause emphysema or pneumothorax, but his answer otherwise was so good that his examiner credited him with almost full marks, thinking that he must have forgotten to put down the matter concerning air escape.

Gangrene.

Gangrene has always been, and will continue to be, a difficulty with students so long as the confused teaching surrounding it lasts. If they are taught that *the cause* of gangrene is total arrest of the blood-supply to the diseased part, the rest can be made plain. Total arrest of the circulation can be brought about by mechanical agents (external, e.g., tight bandage; internal, e.g., ligature of vessels, disease or clotting in them), chemical, electrical, thermal, and other means. It can also result from microbic infection, i.e., the fourth termination of infective inflammation (*Plate XXXIV*). In this rare form of gangrene the infection is primary and the gangrene is due to arrest of the circulation from virulent inflammation.

With the exception of the primary infective form, all varieties of gangrene may be either (1) dry (aseptic), or (2) moist (septic),[1]

[1] All types in the beginning are moist, and throughout all are potentially moist, only requiring infection to make them so.

PLATE XXXIV.

INFECTIVE GANGRENE.

depending upon whether a secondary infection has not or has followed the development of gangrene. This conception is of considerable practical importance, as prevention of sepsis will ensure a dry and favourable form of gangrene, whereas neglect of the necessary precautions is likely to be followed by the dangerous moist variety.

The Abdomen and Pelvis.

A knowledge of general laws in surgery is nowhere of such importance in aiding the understanding of pathological problems as in the abdomen and pelvis, and there is no part of the body in which they have been more neglected.

Pain.—The causes of abdominal pain have been much discussed, and it surprised most of us to learn, after experience had taught us that the greatest pain we had ever suffered was abdominal in origin, that the abdominal viscera were insensitive, and could be cut or burned or otherwise maltreated without causing any discomfort. For more than twenty years I have taught that the great cause of abdominal pain is the *forcible contraction of unstriated muscle*, and I still believe this to be true. Labour pains may be regarded as a physiological example of this pain, all the colics as pathological evidences of it. Hertz, in his careful and brilliant study of the subject (Goulstonian Lectures, Royal College of Physicians, London, March, 1911), came to the conclusion that intravisceral tension is the sole cause of visceral pain; but this does not, I think, cover the whole ground. The most usual stimuli to forcible contractions are the presence of a foreign body plus inflammation, and excess of carbonic acid in the blood increases the irritability of unstriated muscles and predisposes to an attack. As the quantity of carbonic acid in the blood is increased during sleep, an explanation of the frequency with which colics occur during the night is forthcoming.

Effects of Prolonged Contractions.—After prolonged and intense effort exhaustion follows, and, although the cause may not be removed, the effect (pain) disappears. This is common knowledge to those familiar with the behaviour of the pregnant uterus; it is equally true of the urinary bladder, the intestines, the ureter, the gall-bladder and bile-ducts, and other muscular-coated viscera.

Effects of Stimuli.—All hollow viscera react in a similar manner to stimuli.

Effects of Partial Obstruction.—This first causes a thickening of the walls and diminution of the cavity. Examples in the urinary bladder following stricture and prostatic disease (***Fig.*** 31) may be seen in every museum. In gall-stone cases (***Fig.*** 32) the similar condition has been described as Courvoisier's law, but the meaning of

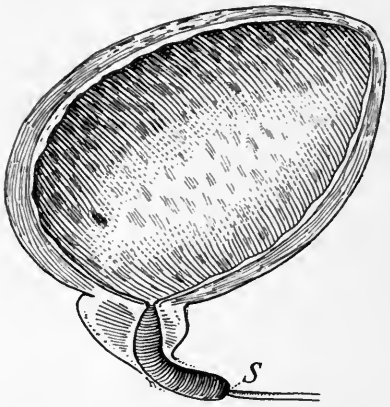


Fig. 31.—Partial obstruction. *S.* Stricture of urethra.

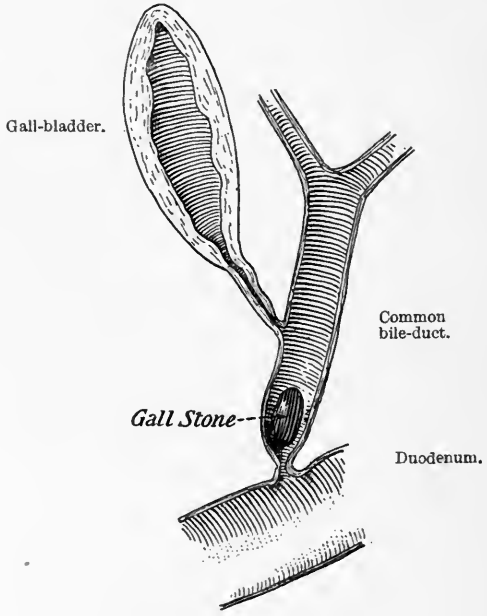


Fig. 32.—Partial obstruction.

it has not yet been generally grasped.[1] In the early stages of pyloric

[1] Microscopic examination of specimens not destroyed by disease proves that the thickening of the wall is chiefly due to increase of the muscular coat of the gall-bladder.

stricture the walls of the stomach are thick and its cavity diminished in size (*Fig.* 33).

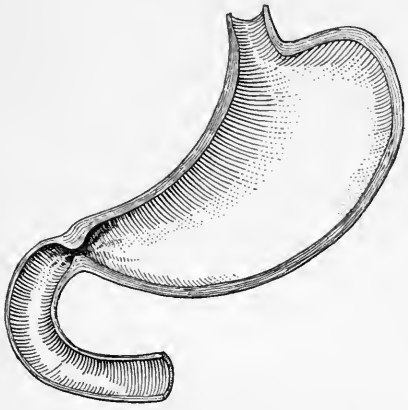


Fig. 33.—Partial obstruction from pyloric stricture.

Effects of Insurmountable Obstruction.—In addition to being followed by cessation of pain, complete obstruction results in paresis

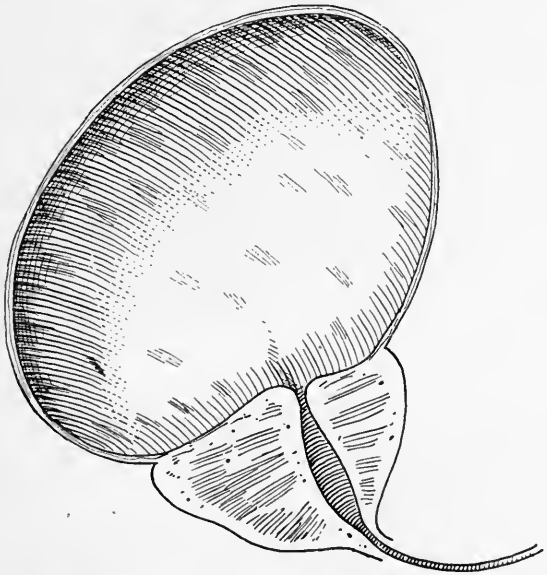


Fig. 34.—Insurmountable obstruction—enlarged prostate.

of the viscus, passive distention of it, and, later, possibly degeneration of the muscular coat. Patients with a urinary bladder (*Fig.* 34) in

this condition most frequently complain of incontinence, and are found to have a distended, tender bladder and overflow. A period of agonizing pain and inability to micturate preceded the period of relief. The gall-bladder has been found so largely distended with its own secretion as to have been mistaken by competent observers for

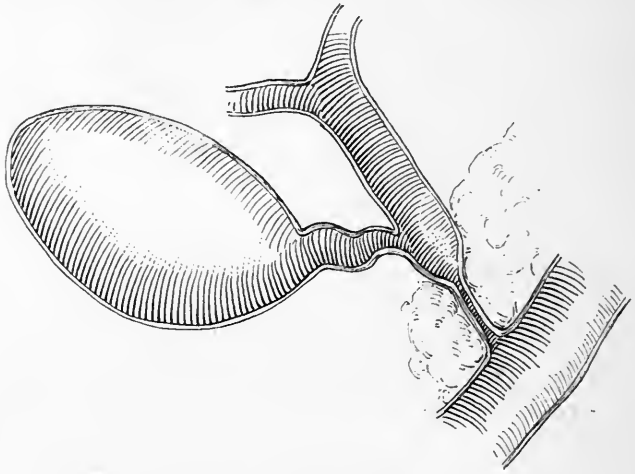


Fig. 35.—Cancer of head of pancreas blocking common bile-duct.

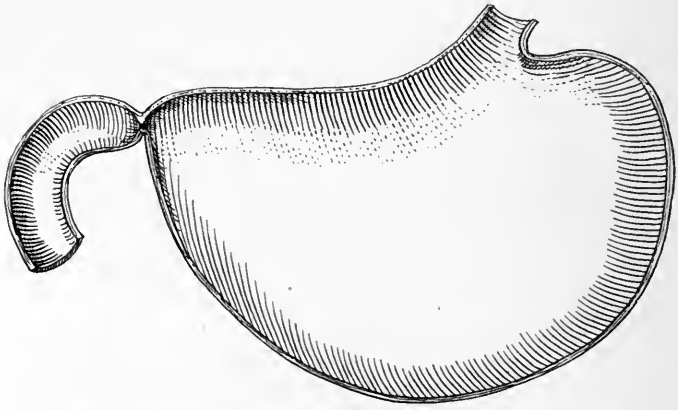


Fig. 36.—Enormous dilatation of stomach due to stricture of pylorus.

an ovarian cyst. Lesser degrees of a similar painless distention of the gall-bladder are familiar to all surgeons. These conditions have been preceded by a violent attack of gall-stone colic, which has driven a stone or stones into the neck of the gall-bladder or the cystic duct, of sufficient size to cause a complete block. A similar painless distention of the common bile-duct and gall-bladder is produced by

cancerous strictures occluding the duct or by a cancerous head of the pancreas blocking it (*Fig.* 35); painless distention of the cæcum may follow obstruction in the large intestine; the stomach (*Fig.* 36) with a sufficiently obstructed pylorus becomes subject to enormous painless distention, and the same is true of all the hollow viscera.

Tension Gangrene.—Under this title I have described a striking group of conditions which can and do occur in all the hollow viscera.

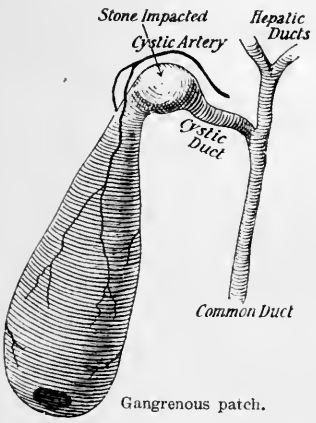


Fig. 37.—Tension gangrene of gall-bladder.

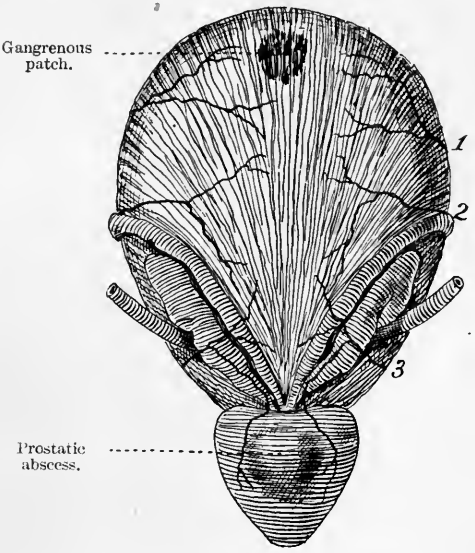


Fig. 38.—Tension gangrene of urinary bladder.

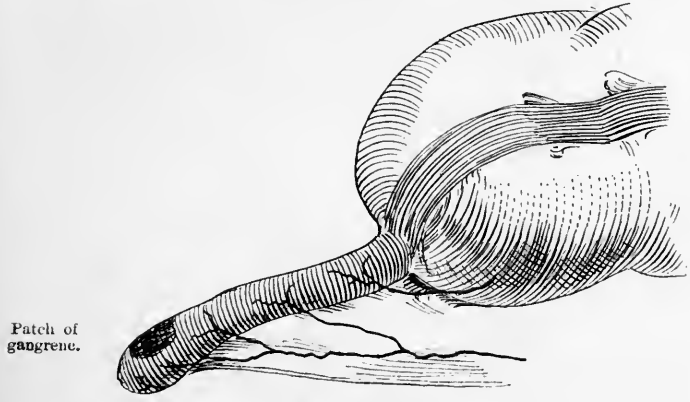


Fig. 39.—Tension gangrene of appendix.

When in any of them active inflammation is added to obstruction.

unless relief is promptly given, the intravisceral tension becomes so acute that the circulation is interfered with, and either partial or

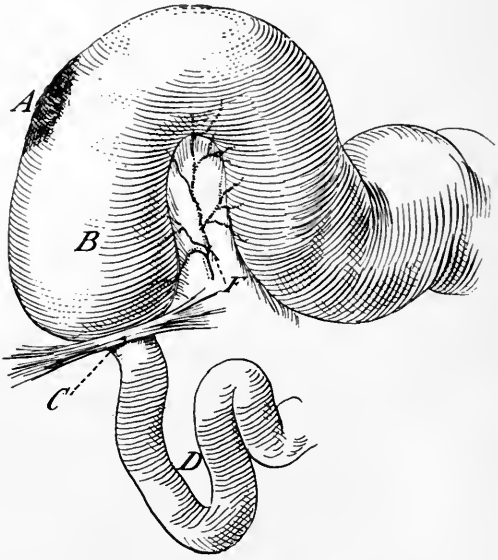


Fig. 40.—Tension gangrene in obstructed intestine. *A*. Gangrenous patch. *B*. Obstructed intestine. *C*. Band. *D*. Empty intestine below obstructing band.

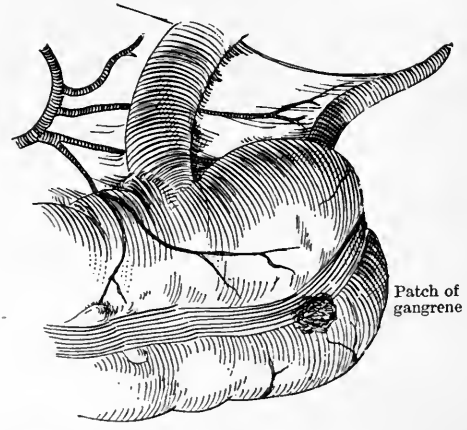


Fig. 41.—Tension gangrene of cæcum following stricture of sigmoid colon.

total destruction follows. The first area to become gangrenous in these cases is, as would be expected, that furthest from the source of

PLATE XXXV.

STONE IN RIGHT URETER.

(From photograph presented by Mr. C. Thurstan Holland.)

The patient, a man, age 23 years, had for two years *slight* pains, off and on, mostly in the right testicle. He passed blood once, three weeks before the *x*-ray examination. There was no pus in the urine. The stone was removed by Mr. Thelwall Thomas on January 28, 1908, from his right ureter. In March, 1913, he had an attack of renal colic on the right side, and a stone was found with *x* rays. March 27, 1913, Mr. Thelwall Thomas removed a stone from a cyst in the upper pole of the right kidney. The kidney was carefully examined and *was found to be healthy*. Both stones were almost entirely calcium oxalate. It is obvious that no ordinary force could have driven such a stone down the ureter, and the condition of the kidney five years later proves that the stone had not blocked the ureter sufficiently to do damage. That an active dilatation of the ureter, as of the female genital canal during labour, had occurred is the only reasonable explanation of the condition. *A*. Stone in ureter.

the vascular supply. In the gall-bladder (*Fig.* 37) it occurs at the fundus, in the urinary bladder (*Fig.* 38) at the superior portion of the posterior wall, in the vermiform appendix (*Fig.* 39) and intestine (*Figs.* 40 and 41) at a point opposite to the mesentery, and in all as a rounded or oval patch.

Foreign Bodies in Muscular Tubes.—When a foreign body, such as a stone, gets into the ureter (*Plate XXXV*), urethra (*Fig.* 42), bile-duct (*Fig.* 43), or intestine, it is spasmodically grasped, and, independently of its size, may produce complete or temporary obstruction. Thus

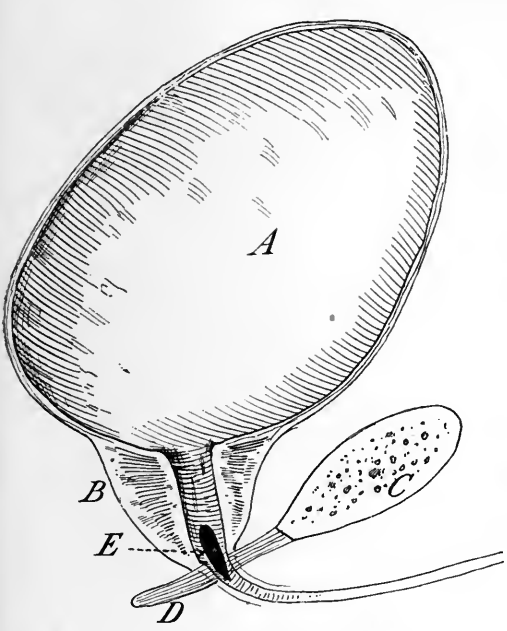


Fig. 42.—*A.* Bladder distended. *B.* Prostate. *E.* Small stone causing retention. *D.* Triangular ligament.

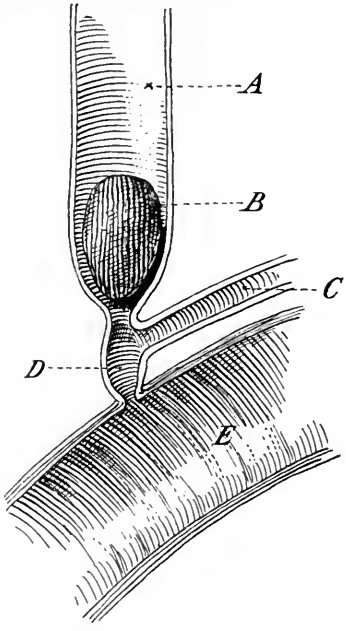


Fig. 43.—*A.* Common bile-duct. *B.* Stone. *C.* Pancreatic duct. *D.* Ampulla. *E.* Duodenum.

a stone in the ureter produces hydronephrosis, a stone in the urethra retention of urine, a stone in the common bile-duct jaundice, and in the intestine obstruction. After a time in each instance the spasm relaxes, and relief follows. It is difficult for a stone, however large, to block any of these muscular tubes completely and permanently (*Plate XXXV*), because active dilatation of them round the foreign body commences after the spasmodic contraction subsides. Every experienced surgeon has seen a ureter or a common bile-duct of the size of a small intestine from this active dilatation, and due to a stone in it.

Sacculi.—All of the hollow viscera are subject to hernial protrusions of their inner through their outer coats. They are well known in the urinary bladder (*Fig.* 44), in all parts of the gastro-intestinal tract, the gall-bladder (*Fig.* 45), the vermiform appendix (*Fig.* 46), and the Fallopian tubes.

Everywhere, except in the colon, there has been agreement as to their nature and their name. They are always, so far as is known, associated with some defect in the walls of the involved viscus and some obstruction to its outflow. In the colon they are usually

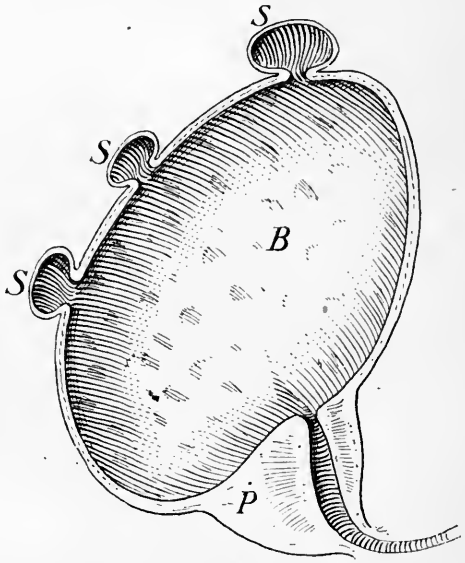


Fig. 44.—*S.* Sacculi of urinary bladder. *B.* Bladder. *P.* Prostate.

described in current literature as diverticula, and this is one of the unfortunate consequences of narrow pathological views. More than once previously I have drawn attention to points which should distinguish the diverticula from sacculi, and they are as follows: The diverticula are of congenital origin, all of the coats of the intestine enter into their composition, they may be found at any age, are single, and have an independent vascular supply of their own. The sacculi are acquired, are chiefly composed of the inner intestinal coats, are seldom found in youth, being limited to aged persons, are multiple, rounded in shape, seldom attain to large size, and have no special vascular supply.

The pathological happenings, however, in diverticula and sacculi

closely resemble each other. Concretions may be found in each, and inflammation, with its usual terminations, occurs in both. There is

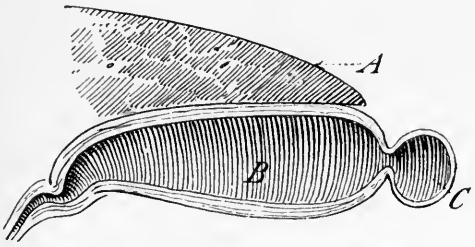


Fig. 45.—Sacculus of gall-bladder. *A*. Liver. *B*. Gall-bladder. *C*. Sacculus.

abundant evidence that Meckel's diverticulum, like the vermiform appendix and the sacculi, may harbour concretions, or, as a result of inflammation, may become fibrosed, be partially destroyed by ulceration, or totally by gangrene. In all of them abscess or peri-

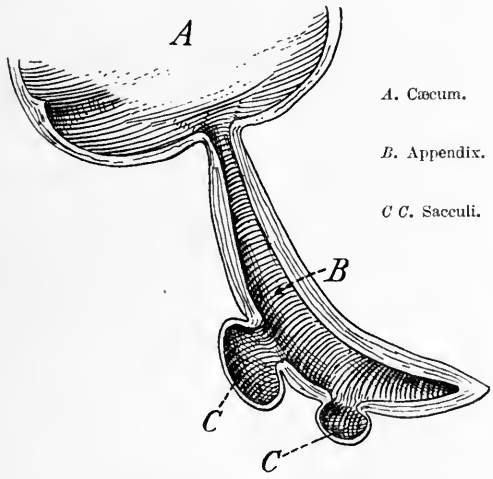


Fig. 46.—Sacculi of vermiform appendix.

tonitis may follow perforation, and early operation may rescue the victims of each from death.

Calculi.

The favourite positions for calculus formation are the hollow abdominal and pelvic viscera, though they have been found in many

parts of the body and in different organs (blood-vessels, brain, salivary glands).

In ordinary conditions they produce few or no symptoms, and merely act as foreign bodies predisposing to infection, with a natural tendency to escape by abscess formation.

Bladder calculi and their conduct are best and longest known to surgeons. Many of these have reached an enormous size without producing serious symptoms or much discomfort. The symptoms of a bladder stone described in surgical text-books are those of calculus plus cystitis. I have seen urinary fistulæ in the perineum and above the pubis—a consequence of abscess formation, when nature has attempted to extrude the stone and relieve the symptoms.

Renal calculi may be present in the kidney for years and cause no symptoms. The symptoms described as characteristic of renal calculus are due either to mechanical obstruction and increased renal tension, which may result from other causes, or to forcible contraction of the muscular coats of pelvis or ureter, especially with superadded infective inflammation. The offending renal stone may eventually be expelled through the discharge of an abscess in the loin, and a natural cure can be wrought in this way, though usually with the loss of the affected kidney by suppuration.

Biliary calculi are frequently found in the gall-bladder, and even occasionally in the common bile-duct, when the most carefully taken history fails to elicit any symptom which could be fairly connected with them. It is twenty years since I pointed out that biliary colic is the result of forcible contractions of the gall-bladder or bile-ducts, due to their violent efforts to expel the stone or stones, and that inflammation of the lining membrane of the gall-bladder or ducts is an almost constant part of the needful stimulus. Biliary, like vesical and renal, calculi can be extruded as the result of suppuration and escape through the gastro-intestinal tract, from the surface, or into the peritoneum, where they may become encysted.

Stones may travel without causing painful spasmodic contractions down both the ureter and the common bile-duct if their lining membrane is not inflamed; in each case a natural cure can follow.

Inversions, Torsions, and Strangulations.

Inversions.—All of the hollow viscera may turn inside out, and for each viscus a different name has been given to the same process. In the intestine it has been called intussusception; in the vermiform appendix, Meckel's diverticulum, the ureter, and uterus, inversion; in the urethra, vagina, and rectum, prolapse. It is as yet only possible to speculate as to the cause and to suggest that in most cases an abnormally active portion above has been prolapsed through an

abnormally passive portion below. It is certain that attempts to extrude a tumour in some cases has been the cause of inversion (*Figs.* 47 and 48).

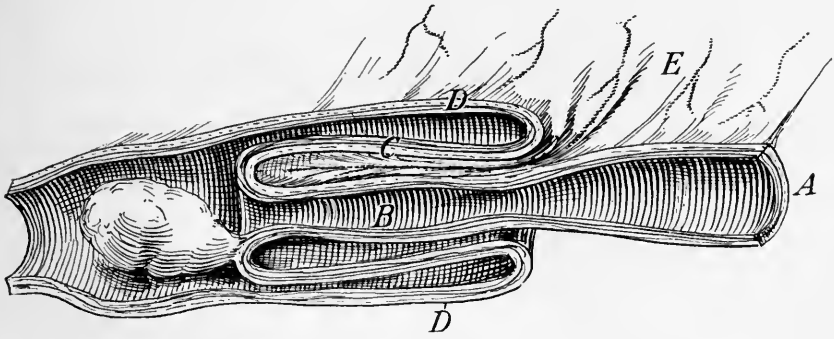


Fig. 47.—Intussusception of intestine due to polypus. *A.* Proximal intestine. *B.* Entering layer. *C.* Returning layer. *D.* Ensheathing layer. *E.* Mesentery.

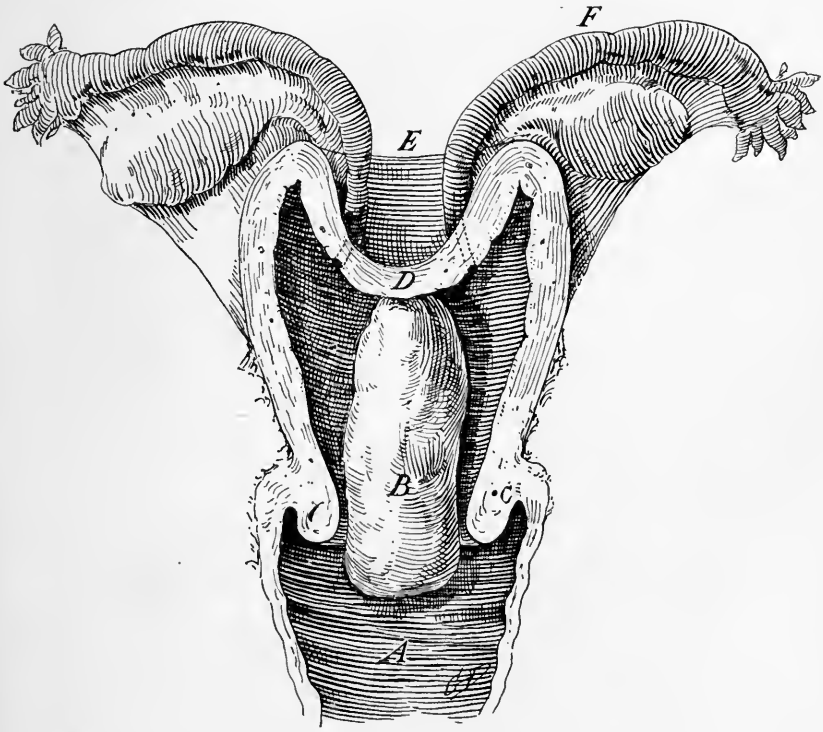


Fig. 48.—Inversion of uterus due to polypus. *A.* Vagina. *B.* Fibroid polypus. *C.* Cervix. *D.* Inverted fundus uteri. *E.* Cup-shaped hollow. *F.* Fallopian tube.

Torsions or twists have been recorded of the intestine (volvulus) (*Figs.* 49, 50 and 51), stomach, gall-bladder, appendix, kidney, spleen,

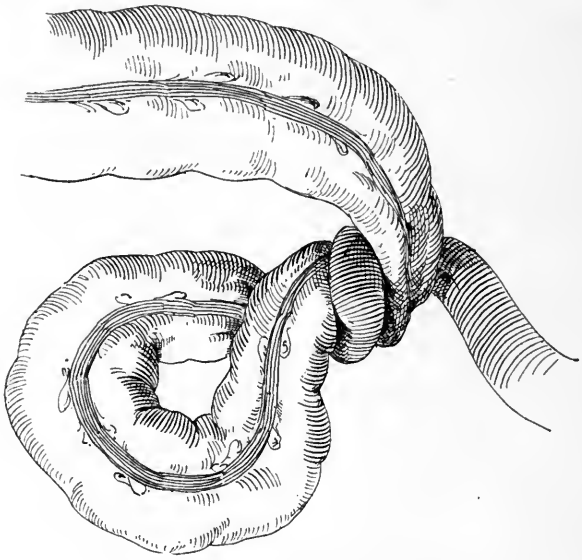


Fig. 49.—Primary volvulus of sigmoid colon.

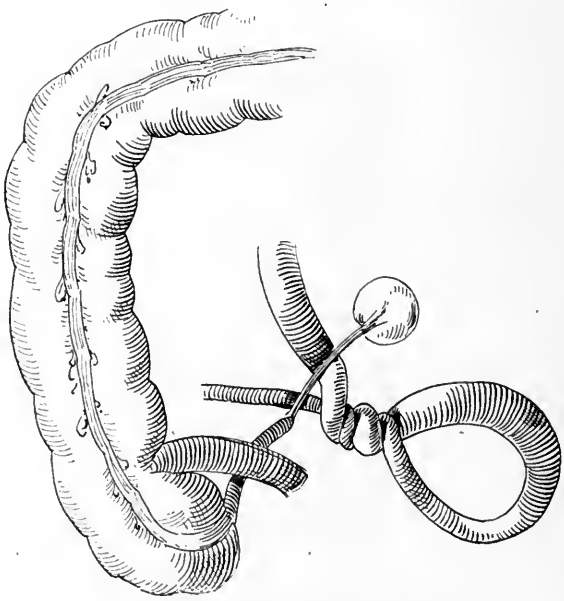


Fig. 50.—Secondary volvulus of ileum

omentum, uterus (*Fig.* 52) (pregnant and fibroid), ovaries (*Fig.* 53), Fallopian tubes and testes. Much in the etiology, pathology, symptoms, diagnosis, prognosis, and treatment of all of them is the same. In all of them there must be a pedicle or stalk to twist, either

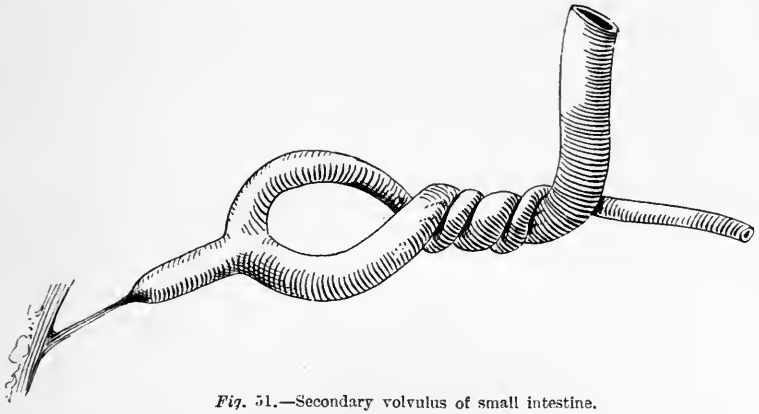


Fig. 51.—Secondary volvulus of small intestine.

Fig. 52.—Torsion of uterine fibroid.

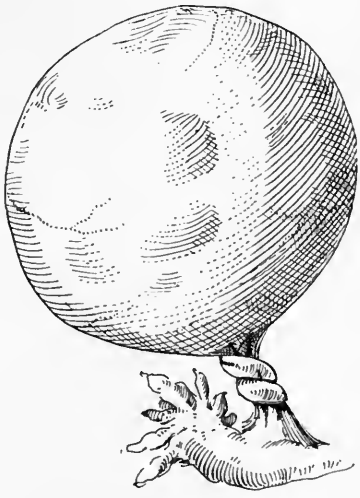


Fig. 53.—Torsion of ovarian cyst.

congenital or acquired, there must be room to turn in, and they must have a shape which allows of torsion. These requirements are best met if an ovarian cyst of moderate size has complicated pregnancy, when, after delivery of a full-time fœtus, all of us are familiar with the occurrence. It is easy to understand the sequence of events then; it is impossible to explain them satisfactorily in many of the other instances recorded.

The pathological changes that occur locally in all instances are the consequence of interference with the blood circulation, which may result either in temporary hyperæmia, fibrosis, or partial or total destruction.*

The symptoms in all are acute sudden pain, followed by evidences of more or less shock, with usually a history of previous attacks of similar character. The diagnosis is based upon these symptoms and the discovery of a tender swelling; the prognosis entirely depends upon whether an early or a late diagnosis has been made; the treatment is prompt operation.

Strangulation.—I have already drawn attention to the fact that inflammation is acute when vascular disturbance is in excess, and that the extent of this is the surest guide to prognosis. It seems scarcely possible to doubt that everyone here recognizes the same to be equally true of the conditions which we have been considering, though students have not been taught this important truth. A hernia is dangerous and the symptoms caused by it are acute if its blood-supply is interfered with, and we then call it strangulated;[1] the same is true of the torsions, the symptoms and prognosis of which are chiefly dependent upon the amount of vascular disturbance produced.

Idiopathic Dilatation.

I can find no better name, even though it is a confession of ignorance, for changes which have been observed in many of the hollow viscera, changes which are very similar in each viscus and which have so far evaded most careful search as to the cause. They may be acute or chronic.

The chronic variety is of greatest interest in the œsophagus (*Fig.* 54), which may be so much dilated and so inefficient in delivery, as to hold an entire meal—the name given to it is 'cardiospasm.'

In the stomach (*Fig.* 55) acute dilatation is of the greatest importance, because recognition of it in time often means the saving of a

* *The same changes as occur in a limb strangulated by a tight bandage.*

[1] An inversion is chronic, and causes little distress till its blood-supply is actively disturbed—until, that is, it becomes strangulated.

PLATE XXXVI.

Idiopathic Dilatation of the Colon.

PLATE XXXVII.

IDIOPATHIC DILATATION OF THE COLON.

The hypertrophy extended from the cæcum above to the anus below. The outside figure shows the colon excised from a girl, age 16 years, suffering from idiopathic dilatation. Contrast it with the inner figure taken from the normal of a girl of the same age.

life, and failure to make a diagnosis is likely to end in a calamity. After operations, especially abdominal, following injuries, typhoid fever, pneumonia, after labour, or the application of a Sayre's jacket in cases of Pott's disease of the spine, the stomach may suddenly dilate to such an extent as to fill the abdominal cavity, and the patient soon dies unless relieved by the passage of a stomach tube.

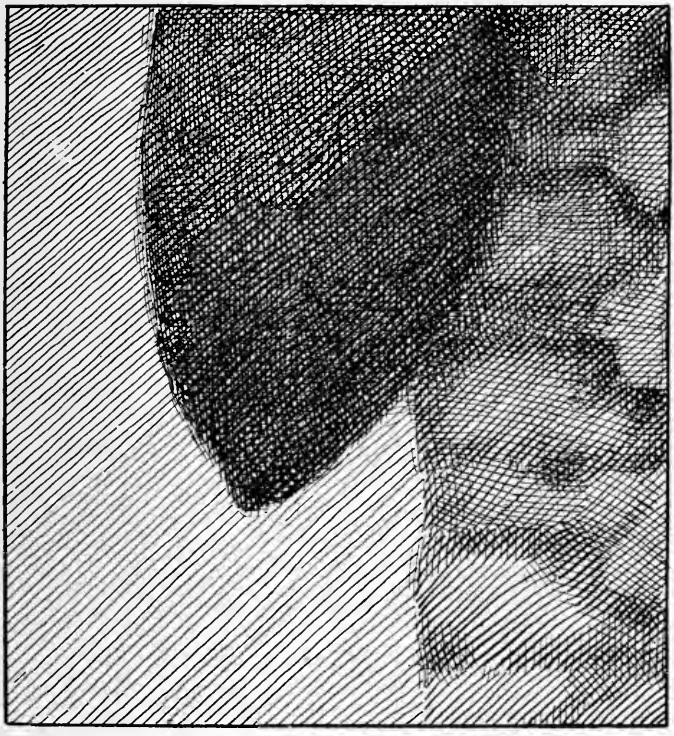


Fig. 54.—*X*-ray photograph of œsophagus with bismuth meal.

In the small intestine the condition is known as paralytic ileus, and this chiefly follows abdominal operations, though it occurs occasionally in the course of Bright's disease and diabetes, and may happen after labour or injuries not involving the abdomen. The first sign of it is painless distention of the abdomen, which may only be increased by purgatives and enemata, and which may even refuse to be relieved by an enterostomy, and in the end cause death.

In the large intestine the chronic variety has attracted much attention and is known by the name 'Hirschsprung's disease' (*Plates XXXVI* and *XXXVII*). Though the sigmoid flexure is its favourite

site, the entire colon may be affected by it, and the abdomen is then distended by enormous coils of intestine containing many pounds of fæcal matter.

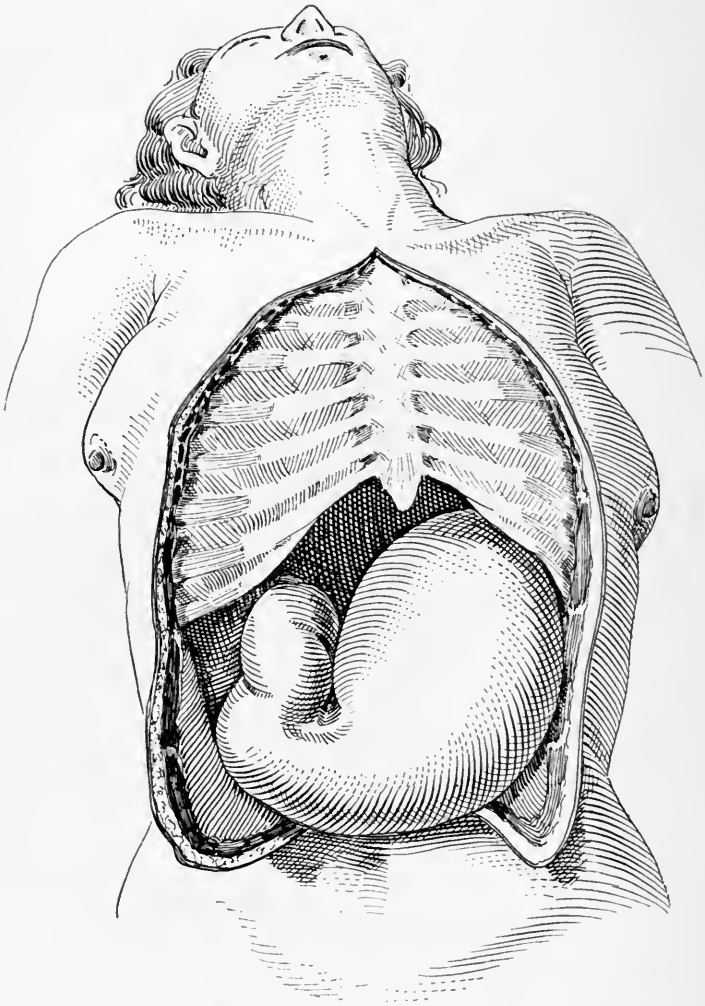


Fig. 55.—Acute dilatation of the stomach.

For the rectum a similar condition is known as 'ballooning,' and in the older medical works considerable importance was attached to it as a sign of mechanical obstruction somewhere in the bowel above, but this interpretation is now known to be fallacious.

Acute dilatation of the bladder is a common sequela to some

PLATE XXXVIII.

IDIOPATHIC DILATATION OF THE BLADDER.

operations; the chronic variety is rare. A boy, age 9 years, under my care in the Infirmary, had a bladder so distended as to be mistaken for a large cystic tumour (*Plate XXXVIII*), and his abdomen measured 27½ in. round at the level of the umbilicus. The passage of a catheter prevented an unnecessary operation, and a few days later more than five and a half pints (114 oz. of urine), which apparently caused him no inconvenience, were removed from his bladder by catheter. Active contractions, such as occur in the dilated colon, were observed whilst the bladder was emptying, making the resemblance between the two conditions one not to be forgotten. Enormous dilatation of the bladder and ureters has also been found in new-born babies, and no ordinary mechanical cause could be given as an explanation. I have also seen conditions which seemed to be like these in the gall-bladder, the common bile-duct, and the uterus.

In concluding, though it might seem scarcely necessary after what has gone before, I wish to emphasize my belief that success in understanding and teaching surgery depends upon unceasing recognition of general principles. Many things, that at first sight appear to be disconnected, can be brought into line if studied from this point of view, and I am convinced that a position of secondary importance should ordinarily be assigned to the consideration of detail.

POST-GRADUATE TEACHING OF SURGERY.

THE INAUGURAL ADDRESS FOR 1914–15, DELIVERED BEFORE THE MIDLAND MEDICAL SOCIETY.

Twenty-five years ago registration was the trade-mark of lifelong efficiency to a medical practitioner. For centuries advances in medicine and surgery had been so slow that a good medical education then sufficed for a lifetime. But, on the other hand, progress has since been so rapid that Sir William Osler has said with truth that in five years the isolated practitioner requires a month of hospital work to bring his knowledge up to date, that in ten years he requires a year of study, and that at the end of twenty years he is in such depths of ignorance as to be hopeless. The consequence of this rapid advance is that post-graduate study is a necessity of to-day, and my object now is to offer views as to how post-graduate teaching of surgery may be made most useful to the practitioner.

In my early days physicians and medical practitioners occupied a much more important position than they do at present, and surgeons were accustomed to be used as an unpleasant form of treatment, on

their advice. For the present surgeons are pre-eminent, but this is only a temporary phase, because the general practitioner, as soon as he realizes the position, will again become, as he always has been heretofore, the backbone of the profession. The position is this: It is essential to recognize that diagnosis and treatment of any but the simplest case may be beyond the capacity of the most capable single man, and may require the combined aid of a bacteriologist, a pathologist, specialists, a physician, and a surgeon. The fashionable demand for further advice (which should always be forestalled by the practitioner) is generally a reasonable one, though apt to follow unreasonable channels. It must be better guided, controlled, and considered by the practitioner if he is to recover his lost prestige.

My suggestions to-night refer only to the post-graduate teaching of surgery. Surgical advances have forced surgeons to become specialists, so that surgical details are out of place in such a course, and the principles of surgery should have been learned at an earlier date. The chief object of it should be to emphasize practical points in diagnosis, to suggest means of avoiding serious mistakes, and to draw special attention to any definite surgical advance which has a bearing upon treatment. It will be my endeavour in the time at my disposal to suggest directions in which I think such teaching may be made useful.

Diagnosis, every one admits, is the most difficult problem in either medicine or surgery, and the greatest authorities are too often made to realize their impotence when faced by anything beyond the ordinary. It is fortunate that in practice the most important question for the practitioner is: Does this case require surgical treatment or not?

Treatment cannot be satisfactory where diagnosis is faulty; hence the importance of the latter. More and more diagnosis is becoming based upon proof—the discovery of a bacillus, hooklets, spirochætes; *x* rays, and other illuminations; laboratory tests; instruments of precision, etc. But, for ever, a great part of diagnosis will remain an art dependent upon the 'clinical instinct' and the proper interpretation of history and physical signs. The art of diagnosis is the stronghold to be specially cared for by the practitioner, because it is yet the most useful and often the only guide.

The general appearance and behaviour of a patient, if rightly interpreted, may afford the clue to a diagnosis by suggesting that some organic cause is at the bottom of the disturbance in health. A first striking impression of something seriously wrong should never be neglected or forgotten; the insatiable, irritable restlessness preceding a fatal termination in many serious illnesses is not likely to mislead the experienced; the chronic anæmia of small repeated

hæmorrhages; the sallow, hopeless face of cancer patients; the pallid transparency consequent on tuberculous infections; or the muddy anæmia of syphilis, may be more useful than any other guides.

Symptoms, such as pain, loss of weight and condition, repeated chills, frequent micturition, recent development of irregularity of the bowels, rises in the temperature, and other common complaints, should no longer be regarded simply as conditions requiring treatment, but as danger signals of something wrong and calling perhaps for frequent and difficult investigations in order to discover their cause. The time has passed when decision as to treatment was a choice between castor oil and opium, because advances in surgery have made the first consideration a surgical one.

Nothing that is too strong can be said against indiscriminate operations for diagnostic purposes; but if there are doubts which cannot be cleared up, and at the same time reasonable possibilities of an operation doing good, patients should not be deprived of the chance operation offers. This statement is devoid of real meaning unless we know who entertains the grave doubts, but an example will make my meaning clear. A physician of scientific repute has made a diagnosis of pyloric stricture, probably malignant. Local examination shows a pyloric lump and a dilated stomach. There are no signs of secondary deposits in the peritoneum either by abdominal or rectal examination, no discoverable deposits in the liver, no enlarged supraclavicular glands, and the general condition of the patient is good enough to justify an operation. All will agree that it should be done.

In a similar case, an enlarged supraclavicular gland is discovered. If this is cancerous, abdominal exploration would be a useless cruelty. By excising this gland with a local anæsthetic and submitting it to microscopic examination, I have more than once saved patients from further operation for hopeless cancer.

Public and professional faith in 'exploratory operations' has, however, been so strong that I have known patients with cancer of the stomach, who had cancerous neck glands, and the 'rectal shelf,' characteristic of cancerous invasion of the pelvic peritoneum, both evident to any careful observer, submitted to operation "to ascertain whether anything could be done." It is often said of exploratory operations that they "do no harm," but nothing could be further from the truth; at the best they are a confession of ignorance, and their failure does harm to the patient, harm to the surgeon, and harm to the progress of surgery. My endeavour, then, will be to offer some examples of the sort of information which I think should be given in post-graduate teaching.

Fractures and Dislocations.

Scarcely anything in my experience has been the cause of so many troubles to practitioners as the diagnosis and treatment of fractures. These can only with certainty be avoided by insistence upon a rule to have an *x*-ray picture in every case of injury where any doubt is possible. The revelations will many times come as a surprise (*Figs.* 56, 57, 58, 59). No medical man who values his reputation, unless obliged by extraordinary circumstances to do so, should undertake the treatment of a fracture unless he can be guided throughout by *x* rays.

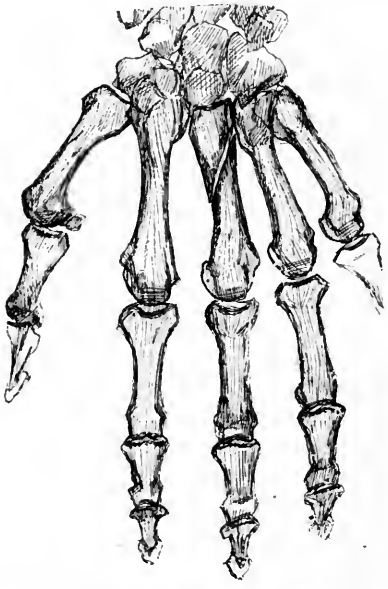


Fig. 56.—'Bad sprain of hand.' Skiagram shows fracture of third metacarpal.

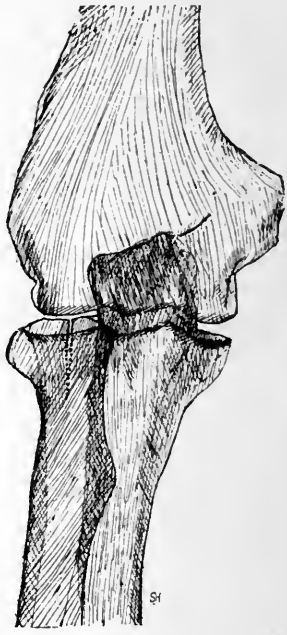


Fig. 57.—'Sprained elbow.' Skiagram shows a longitudinal fracture of the head of the radius.

The rules I give my students for their guidance in the treatment of fractures are :—

1. Apply first aid.
2. Examine for complications—local and general.
3. Reduce deformity.
4. Keep it reduced.
5. Restore function.

Each of these rules should be borne in mind and acted upon if damaging mistakes are to be avoided.

The indications for operative treatment in fractures may be

summarized by saying that they are such as imply failure to satisfy any of the rules for treatment. For example, recently I have had to operate because first aid failed to prevent gangrene of a patch of skin over a displaced tibia; because a fractured humerus had ruptured the musculo-spiral nerve; because deformity could not be reduced; because reduction could not be maintained; and because a fractured astragalus left a useless foot.

Fig. 58.—'Sprained hip.' The patient walked into hospital. Skiagram shows impacted fracture of the neck of the femur.

The mention of fractures would be incomplete if emphasis were not laid on the importance of attention to bandaging. A bandage should *never* be put under a splint. It should *always* be taken off and readjusted if the patient says it is too tight. Provision should be made for observation of the peripheral circulation beyond the bandage. It is only by this care that ischæmic contractions, ulcerations, sloughing, and gangrene from bandage pressure can be avoided.

Fig. 59.—'Sprained neck.' The skiagram shows fracture dislocation.

Dislocations.—The same need of *x*-ray examination is evident in cases of dislocation, for a year never passes but that I see cases of dislocation of the shoulder and of the hip missed, and missed for the lack of such examination (*Figs.* 60 and 61).

Injury to Nerves.

One of the most serious complications of injuries and wounds, and one which has been forcibly impressed on me through legal actions arising from the overlooking of it, has been injury to nerves. These have occurred most frequently from fractures affecting the lower two-thirds of the humerus, from dislocation of the shoulder, and from wounds over the front of the wrist. The result of a serious injury to nerves is, at the best, incapacity for ordinary work for a period of from one to two years, and neglect may mean lifelong incapacity. Fortunately, rough and easily applied tests indicate whether important nerves have been injured or not, and they should never be forgotten or neglected in cases of accident. The sensibility of the skin should be tested by a series of pin-point contacts, and it is wisdom to strengthen the position by asking the patient to move the muscles and tendons below the seat of injury. Deep pressure, it is well to remember, may convey erroneous information, because the patient may feel this even after complete nerve division.

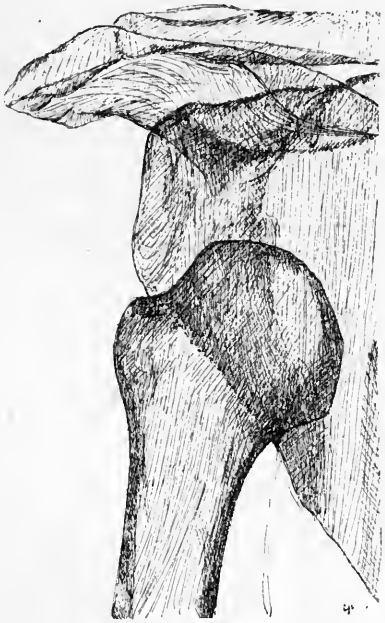


Fig. 60.—'Sprained shoulder.' Skiagram shows subglenoid dislocation of the shoulder.

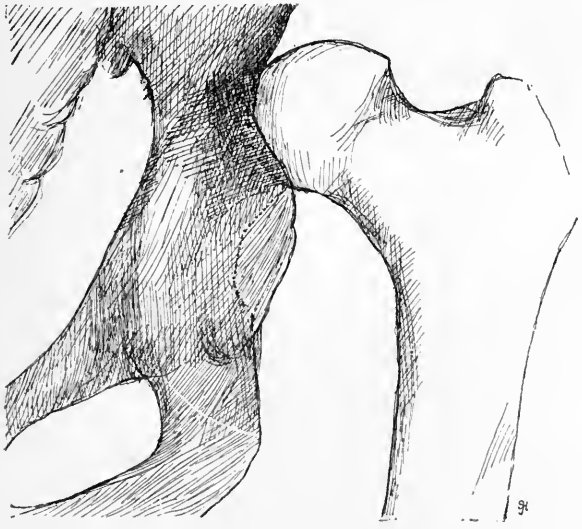


Fig. 61.—'Bruised hip.' Skiagram shows dislocation of the hip.

Wounds and Sepsis.

Every one admits the danger of sepsis, that it still holds first place as the cause of death and delayed convalescence in surgical cases, but the importance of its prevention is not yet sufficiently realized. Perhaps the usual treatment of scalp wounds is the best evidence of this.

Scalp Wounds.—Very few of these are dealt with in such a manner as to satisfy the requirements of present-day surgery. Excepting those arising from a trifling cause and certainly superficial, all should be regarded as serious happenings, and dealt with accordingly. If there is pulsation of blood, discharge, or lotion lying in the wound, it is evident that the skull is fractured; but it has surprised me to note how frequently this striking sign can be overlooked. In dealing with a scalp wound, it should first be packed with gauze wrung out of antiseptic, and the hair surrounding it should be completely removed with scissors or a razor. The wound should then be fully explored with the help of retractors or by a steril-

Fig. 62.—Boy who fell off a hay cart and wounded his face. The wound was cleansed and sutured, and healed by first intention. Two years later it 'began to gather,' and the prong of a steel fork (*Fig.* 63) was found to be the cause.

Fig. 63.

ized gloved finger, or, if a punctured wound, by a sterile probe, to exclude the possibility of a foreign body being left in it or of a fracture of the skull being missed. Many times I have removed foreign bodies over which the divided scalp has been carefully sutured (*Figs.* 62 and 63), and at others have heard when the patient was hopelessly ill from septic meningitis, or at post-mortem examination after he had died of it, that no suspicion had been entertained of anything seriously wrong, "because he was so fit" after the injury. It is only possible to guard against such occurrences by making it a rule to explore thoroughly every scalp wound, and, if this cannot be done without enlarging it, to perform this operation. The same rule should be applied to most other wounds, especially those of the abdominal parietes. In all wounds soiled with earth or occurring in connection with stables, the possibility of tetanus resulting is so real that extra precautions should be taken and an injection of anti-

tetanic serum given. There is abundant proof of its usefulness as a prophylactic, but no convincing evidence that it does any good when tetanus has developed.*

Head Injuries Requiring Operation.—If a depressed fracture, or one over important blood-vessels, is found underlying a scalp wound, most surgeons agree that the patient should be trephined. Most would also agree that a depressed fracture, whether compound or not, should be trephined. It is when these local indications are wanting that difficulties and doubts arise, and these require grave consideration. In the past indiscriminate operating for serious head injuries and the many consequent failures have brought disrepute on cranial surgery, but lives are now lost which might be saved by a timely operation. I have had the opportunity of seeing post-mortem examinations when death has followed extradural and meningeal hæmorrhages which have not been successfully dealt with because there was no other serious damage. I have also seen œdema, consequent on bruising of the brain over a limited area, the cause of a fatal result.

An operation is not likely to be useful if the injury is a very serious one, as when a fall from a great height, or an overwhelming blow, or a serious crush, is the cause of it. On the other hand, an unexpected calamity may follow an apparently trifling injury, as illustrated by a recent post-mortem examination I saw. A healthy miner, aged 40, struck his head against the roof while at work on Friday. He did not lose consciousness, and after a rest returned to work. He worked on Saturday, played on Sunday, worked again on Monday, and on Tuesday morning at 11 o'clock was found lying unconscious in the mine. Next morning, after a series of general convulsions, he died. Post-mortem examination showed a bruise on the scalp over the anterior superior parietal region, with indentation of the skin over its centre. Bruise-staining extended to the skull, which was not fractured. There was a large subdural hæmorrhage covering the left hemisphere, the base of the brain, and the lower half of the right hemisphere. There was no other sign of injury or disease.

In determining whether an operation is or is not desirable, the next aid, after consideration of the character of the injury, is afforded by the progress of events. A bruise on any part of the body is followed by swelling round the injured area, and the brain furnishes no exception. The swelling, by causing increased intracranial tension, may cause death. Rupture of an insignificant intracranial blood-vessel may cause death in a similar fashion. In either case relapse of unconsciousness may occur after a partial or entire recovery. If, after a period of improvement in the symptoms, there is relapse, a decompression

* *This truth has been driven home by war experiences.*

operation should be performed without delay, and this may the more readily be undertaken since Dr. Harvey Cushing has shown us how it can be done quickly and with safety.

In spite of exceptional instances, it is a rule that, if a serious head injury is immediately followed by profound unconsciousness, and there is a quickening pulse and rising temperature, an operation will do no good, because the injury is a fatal one.

The Danger of Probes and Interference with Septic Tracts.—A desire to get at the bottom of things, and to find out 'exactly' what is wrong, has been, and still is, a cause of surgical calamity. If this is to be avoided, it is necessary, before 'exploring' anything, to take special care. In illustration may be given our experience with compound fractures, especially those due to indirect violence. It has been the exception to see them develop septic infection if they have been treated by the simple application of a first-aid dressing; they have rarely failed to 'become septic' after being explored by finger or probes before coming for treatment.

Two painful experiences of my own are examples of this, and emphasize, what every surgeon knows, the danger of interference in septic areas.

A gentleman consulted me regarding an anal fistula of eleven years' duration. After an illness associated with the original abscess, he had never been ill or off work for a day with it, though occasionally when it did not discharge he had some discomfort until it did so. I entertained no reasonable doubt that there was an internal as well as an external opening, but, as my finger in the rectum could not discover it, I introduced a probe easily, without causing pain, and arranged to operate at his convenience. He then went to his office, developed a rigor, and passed through a dangerous illness of some weeks' duration from diffuse inflammation followed by suppuration round his rectum.

A young man consulted me regarding a sinus in his groin. He looked the picture of health, and only complained of a small escape of watery discharge which necessitated a daily dressing. From the history it was clear that a year previously a large tuberculous abscess had discharged spontaneously in the position of the sinus, but the discharge had been steadily decreasing, and his health had been restored. No one had been able to tell him the cause of this, and to discover it I injected the sinus with bismuth paste, and had him *x* rayed. A narrow track could be seen running up to the front of the sacrum, and every one concerned was much pleased that the source of the mischief had been so painlessly discovered. The same evening he had a rigor, for some weeks was dangerously ill from sepsis, and only recovered with difficulty. If he had been left alone, his sinus would have healed without further trouble in the course of time.

Abdominal Emergencies.

A differential diagnosis of the cause of a sudden pain in the abdomen may occasionally be impossible, but it is of urgent importance to know whether it is of a serious character or not. The most serious causes are visceral perforations (*Fig.* 64), intra-abdominal hæmorrhages, and colics, of which the variety due to intestinal obstruction is of the greatest danger.

By watching the development of diagnostic skill in my house surgeons, who were changed every six months, I soon learned that they had developed faith in only a few points, and that under ordinary conditions they were seldom wrong.

In the presence of an abdominal emergency it is a good rule to exclude, by examination of the hernial sites, a strangulated hernia, which is still too often missed.[1]

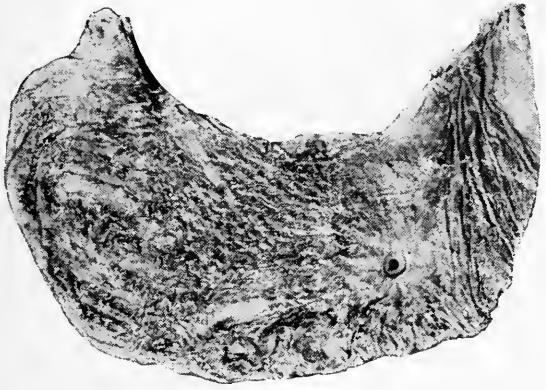


Fig. 64.—Acute perforating gastric ulcer.

The appearance and conduct of the patient are above every other sign in estimating the serious or trifling nature of the condition.

Sex is a useful guide, because in women ovarian cysts (*Fig.* 65) and fibroids with twisted pedicles (*Fig.* 66), or ruptured ectopic gestations, have to be reckoned with, and in the male they may be excluded. In both sexes it is good to remember that acute appendicitis is the most common, and therefore the most likely, cause of an abdominal emergency.

The most important aids in forming a diagnosis are: (1) The history preceding and immediately following the attack—for example, in perforating gastric and duodenal ulcers, a preceding history of 'indigestion,' and accompanying the attack a sudden 'deadly'

[1] Since this address was delivered I have seen two such cases.

pain which continues; in appendicitis, a history of similar attacks, though perhaps short and trifling, with, during the attack, at first a diffuse or epigastric or umbilical pain, not so sudden as that of duodenal perforation, later tending to localize in the right iliac fossa, and sickness, generally followed by a rise in temperature; in ruptured ectopic gestation a history of menstrual irregularity and previous

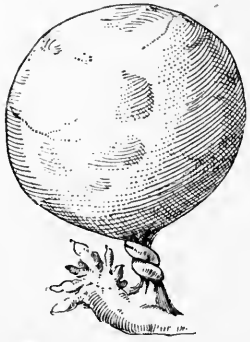


Fig. 65.—Volvulus of ovarian cyst.

Fig. 66.—Volvulus of subperitoneal fibroid.

threatening cramp, followed by a hæmorrhagic vaginal discharge; in gall-stone colic, violent epigastric pains which 'caught the breath,' possibly followed by jaundice; in renal colic, frequent micturition during the early part of the attack, possibly macroscopic or microscopic hæmaturia later on; in acute intestinal obstruction pains of a more

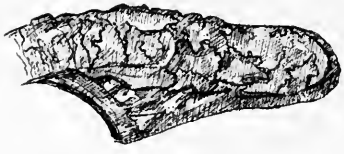


Fig. 67.—Appendicitis: Acute inflammation. First stage: Shock and colic from efforts of appendix to empty itself.

Fig. 68.—Appendicitis: Total destruction—gangrene. Second stage: Reaction = cessation of afferent impulses because the nerves are destroyed.

paroxysmal character, wind retention, and urgent sickness. For each variety a special previous history and a particular type of onset.

All of them are apt to progress in three stages:—

1. Shock (*Fig.* 67).
2. Reaction (*Fig.* 68).
3. The stage special to each variety.

It is often of supreme importance to remember this sequence, because after the shock stage has passed, a patient with ruptured stomach, intestines, liver, or spleen, with stab or gunshot wounds of any or several of the viscera, may soon have so complete a reaction as to enable him to pull himself together and walk home, and so otherwise conduct himself as to lead any but the most careful observer astray. Now, if operations could be performed in every acute abdominal case during the first or second stages, the mortality would not be more than 5 per cent. The present large fatality is due to delay, chiefly arising from uncertainty in diagnosis, and has diminished with each decade, though not so quickly as it should have done. The physical signs during the second stage, to which we have learnt to attach great importance, are two in number—namely, tenderness around the seat of the lesion, and rigidity of the muscles overlying it. A third sign—shifting dullness in the flanks—has so often aided me that I attach considerable importance to it also.

All available evidence has proved :—

1. *That the fate of a patient, the victim of an abdominal emergency, chiefly depends upon the skill and promptitude of his doctor, and that very special surgical skill is of altogether secondary consequence.*

2. *That when the history and the signs suggest a possibly serious abdominal lesion, the patient should be sent at once into a properly equipped hospital for observation, and, if necessary, operation.*

Diagnosis and Treatment in Urinary Diseases.

All of us know the great importance of surgical cleanliness in using a catheter, but some lives are lost, and the health and happiness of many more are still ruined yearly for want of a small employment of skill and a large use of scrupulous care. For surgical purposes it is well to regard the urinary tract as often in fact, and always potentially, a septic one. The dangers of probing and of explorations will then be appreciated. No such alarming surprises can be experienced as here, where the most painless and apparently simple manipulations may be followed by most serious consequences.

The disturbances produced by an attack of acute urinary retention can scarcely be misunderstood, but it is sometimes forgotten that the bladder, like all other hollow viscera, soon ceases to respond to ordinary stimuli when it has to deal with an unsurmountable obstacle. The forcible contractions which have caused the early pains abate, passive dilatation of its wall occurs, and a painless distention of its cavity with pressure overflow of its contents follows. This is well illustrated in elderly men with prostatic retention (*Fig.* 69). After hours of suffering their retention is relieved by dribbling, and patients in this condition are apt to complain chiefly of " disturbance of their

stomachs," and possibly forget to mention their 'incontinence.'[1] It is a good rule to remember that in adults 'incontinence' generally means retention and overflow. This knowledge, however, requires careful application, as a painful experience, early in my surgical career, taught me. I was consulted by an elderly gentleman in regard to his stomach. He had no appetite, was always thirsty, often sick, occasionally troubled by hiccough, and looked sallow and ill. On examination, I discovered a urinous odour and that his clothing was wet. The incontinence had followed and relieved an attack of retention three months before. The distended bladder formed a distinct prominence reaching to his umbilicus. I passed a large silver catheter, and to his surprise withdrew more than a quart of urine. Next day I found that he had passed no urine, and an instrument withdrew only a few drops of blood-stained fluid from his bladder. From that time his kidneys excreted no more, and in three days he died. I now know that if his bladder had been emptied slowly through a very small instrument during a period of some days, and with scrupulous care, he would have recovered. This knowledge is even more important now than it was then, because it would now be possible to remove the prostate successfully at a later stage. Prostatectomy represents one of the greatest recent advances in surgery. It is not even yet appreciated at its full value, and Freyer has made the whole world his debtor by his strenuous advocacy of its indubitable claims.

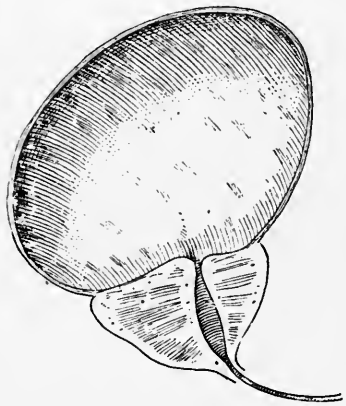


Fig. 69.—Dilated urinary bladder with enlarged prostate and 'incontinence.'

In women equally dangerous mistakes may be made in these chronic retention cases. I have had young women with backward displacement of the pregnant uterus and elderly women with fibroids sent to me for operation for ovarian cysts, the passage of a catheter revealing a distended bladder.

Another of the greatest surgical advances has been made in urinary work by the introduction of the cystoscope and ureter catheter, which have revolutionized this branch of surgery (*Fig.* 70). The discovery of blood or pus in the urine, followed by immediate cystoscopic examination, may lead to the discovery of an early cancer or

[1] In some cases the bladder may be distended to the umbilicus and the patient still has control.

tuberculosis of the bladder or kidney, both curable by operation. Two patients from whom I excised the kidney for tuberculous pyonephrosis, the first twenty and the second fifteen years ago, are still alive and well. It is not yet common knowledge that genito-urinary tuberculosis is not at all rare, that it is frequently due to infection from a single kidney, that diagnosis is possible when it is thus limited, that the disease can be permanently arrested by excision of the diseased

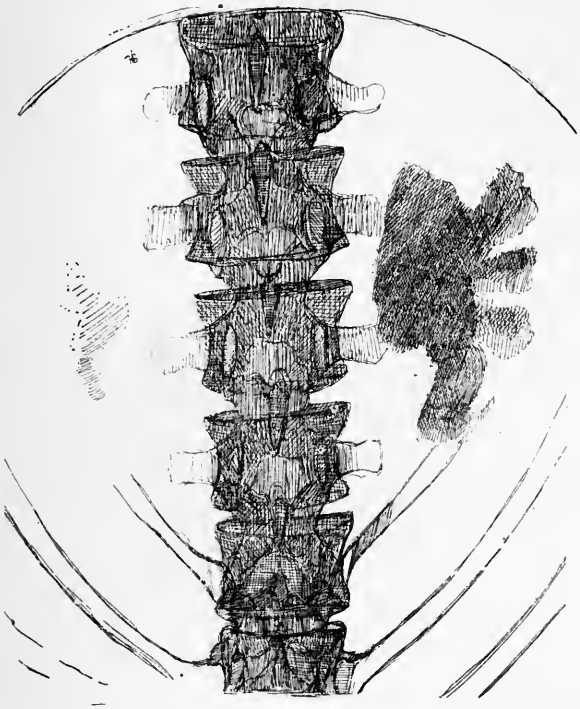


Fig. 70.—Hydronephrosis demonstrated by ureter-catheter injection of collargol and *x* rays (*R. J. Willan*).

kidney, and that nephrectomy, in competent hands, is an operation of small danger. Without operation many of these cases live for prolonged periods. One patient of mine did so for at least fifteen and another for eight years, the diagnosis in both cases being verified by post-mortem examination. Death, however, after prolonged misery is the only reasonable expectation, and exceptions are so rare that many experienced surgeons deny their possibility. An early diagnosis, followed by nephrectomy, is the only known means of averting this.

The Signs of Malignant Disease.

It is the accepted general belief that cancer in its earliest stage is a local disease, and is then curable by excision. It is also becoming increasingly recognized that cancer seldom develops on or in a healthy part, but is preceded by some chronic change to which the name 'precancerous' has been given. Recognition of these changes and excision of the diseased area are the most promising advances in the prevention of cancer. The importance of an early diagnosis in developed cancer cannot now be over-estimated, because recent surgery holds out not only hope, but a good prospect of cure.

Unfortunately there are often no early characteristic physical signs and nothing to cause the patient serious pain or any alarm. The textbook description of cancer is based upon examples of advanced disease, more often than not complicated by septic infection, and patients often relate how a lump or an ulcer which had been discovered months earlier occasioned neither their doctor nor themselves any alarm, because there was no pain in it and no symptoms to cause uneasiness. There are, however, certain symptoms and signs so suggestive of malignant disease that, in the elderly especially, this should be excluded if possible, first, by a complete and thorough examination.

These symptoms and signs are :—

Hæmorrhage.—Bleeding from the stomach, from the bowel, from the genito-urinary tract, from nasal polypi, especially in elderly patients, should always suggest the possibility of cancer, as it is the the most common cause.

The Discovery of a Tumour —If a tumour is hard in consistency, nodular on its surface, has an indefinite edge, and is infiltrating the parts in its neighbourhood, there can be no difficulty in the diagnosis. But in patients over 35 especially, it should be a rule that any tumour which does not offer a definite history and present symptoms and signs of its benignity, must be widely excised for microscopic examination. A favourite situation for such tumours is the female breast, where, above this age, 50 per cent are cancers. A fibro-adenoma of the breast, its ordinary simple tumour, is never in my experience seen in women over 30 years of age. It is simple and benign from 15 to 25, and if left alone may not grow larger for some years. Eventually fresh development occurs, it becomes more cellular, less fibrous, and in the end sarcomatous. Consequently, these tumours should always be removed.

The swellings most resembling cancer are due to chronic abscess and fibrosis from sepsis and tubercle, to cysts, and to the condition known as chronic localized interstitial mastitis. The difficulties of diagnosis are usually so great that no doctor should be found willing

to take the responsibility of it. If action is postponed till a clinical diagnosis of cancer is possible, only 25 per cent of cures follow the most radical operation. Bloodgood, of Johns Hopkins Hospital, reports cure of at least 90 per cent of cases in which removal of the tumour for pathological diagnosis, before a clinical diagnosis of cancer could be made, was followed by *immediate* radical operation.

In adult males eight out of ten abdominal tumours, recently discovered, are malignant.

Polypi in the rectum and colon, and papillomata there, and in the bladder and larynx of adults, frequently hide a cancer.

Symptoms of obstruction in the hollow viscera suggest cancer. Twenty-nine out of thirty adults who, without a known cause, develop difficulty in swallowing due to œsophageal stricture, have cancer. The diagnosis of œsophageal stricture is usually easy if the patient be watched while taking fluid or liquid nourishment; it is made certain by skilled examination with *x* rays. It should be borne in mind that, when the stricture is at the lower end of the œsophagus or at the cardiac orifice of the stomach, patients complain of 'vomiting,' because I have found that doctors are often misled by this story. In these cases the 'vomiting' is regurgitation of œsophageal, not of stomach, contents, and, as the œsophagus dilates above the stricture, food may even be retained for a short time before it is expelled. 'Vomiting' immediately after food is taken, or the finding that the 'vomited matter' is not acid in reaction, should suggest the probability of stricture of the œsophagus. The discovery of a stomach tumour in an elderly patient, especially if 'indigestion' is a recent development, and if there is rapid loss of condition, is almost conclusive evidence in favour of cancer. If the tumour involves the pylorus it causes obstruction, and dilatation of the stomach follows. Chronic intestinal obstruction in the elderly is in the very great majority of instances due to cancer. This is most common in the sigmoid loop, and the history of greatest value is one of increasing constipation, with loud wind rumblings, increased by aperients, and spasmodic pains accompanying the flatulence. Cancer in the ileocæcal neighbourhood often causes attacks of obstruction with spasmodic pain, wind rumblings, and vomiting, with alternating diarrhœa and constipation. Cancer of the rectum should always be suspected when alternate 'diarrhœa' and constipation demand frequent attempts at evacuation with small result.

Chronic Jaundice.—Painless chronic jaundice in adult patients is seldom due to anything but cancer. If the jaundice is steadily increasing, and the gall bladder is distended, it is so almost without exception. When I say painless, this refers to the commencement of the illness, and put in the form of an aphorism the position will be

this : *Jaundice, preceded by pain, is most likely due to a gall-stone, but commencing painlessly is due to cancer.* Though operation in these cases has exceptional risk, my view is that if there is no general contra-indication it should be taken. Cholecystenterostomy will relieve the jaundice and the itching in most of them.

Chronic Hoarseness.—In patients past middle age changes in the voice demand laryngoscopic examination. This is all the more important since cancer of the vocal cords, the most frequent cause of chronic hoarseness, has been proved to be one of the least malignant types of cancer, and, when limited to the cords, curable by a simple and safe operation—thyrotomy and excision of the cords.

Fig. 71.

Chronic Irritation.—The most important predisposing cause of cancer known is chronic irritation, but this knowledge is yet not sufficiently acted upon. Irritated ulcerated warts, moles, or nævi in adults are either cancerous already or so likely to become cancerous that they should be removed without delay.

Ulcers of the tongue which do not heal promptly after any source of irritation has been removed, or which have not healed after a few days of treatment with iodide and mercury, should be excised for microscopical examination. Patches of leucoplakia on the tongue (*Fig.* 71) or cheek, penis or vulva, require constant supervision, and when irritable or ulcerated should be promptly and widely excised, as they are frequent precursors of cancer. Cracked and irritated

scars from burns or scalds, if neglected, always develop cancer (*Figs.* 72 and 73). Raised pigmented rough patches on the skin of elderly patients, scaly thickened patches, obstinate cracks (*Fig.* 74) or warts on the lips (*Fig.* 75), sores on the nipple which resist ordinary treatment, are all likely to become cancerous, if not so already, and should

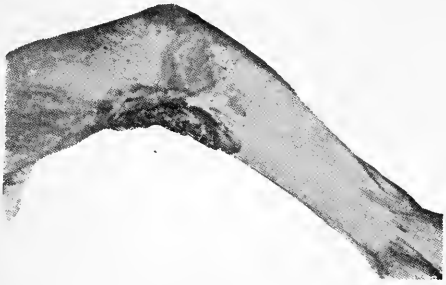


Fig. 72.—Burn scar which developed epithelioma.

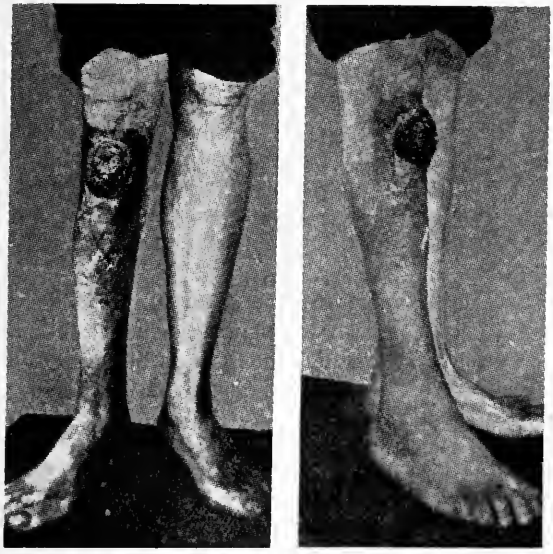


Fig. 73.—Epithelioma on old burn scar of leg.

be excised. The irritation effects of *x* rays, paraffin (*Fig.* 76), soot, etc., are so well known as predisposing causes of cancer as to require no further mention. Not so well recognized are the irritation of gall-stones and of chronic gastric ulcer. The best surgeons are unanimously in favour of operating for gall-stones as soon as the diagnosis can be

made, because they recognize that gall-stones are a serious possession, and cannot be removed by any other means, that operation is safe and satisfactory if performed when the stones are still in the gall-

Fig. 74.—Skin cancer; old field worker. Area where tears trickle.

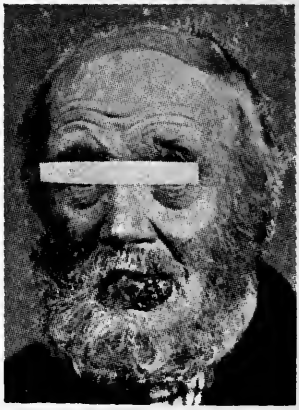


Fig. 75.—Epithelioma of lip; clay-pipe smoker.

bladder, but neither safe nor certain in results when stones have escaped into the ducts, or when such septic changes have been set up as to preclude the possibility of complete recovery. They also recognize that cancer of the gall-bladder follows the irritation of gall-stones with sufficient frequency as to make their removal advisable for this reason alone.

Fig. 76.—Paraffin worker's epithelioma.

The irritation of a chronic gastric ulcer is now accepted as a predisposing cause of cancer, so that, apart from the fact that the dangers of hæmorrhage and perforation are greater than those of operation in competent hands, the predisposition to cancer is —without attaching too great importance to it—an additional reason for the recommendation of operation in ulcer cases. The diagnosis of stomach cases has been hindered rather than helped by chemical and laboratory advice, though all recognize that these may be useful aids. If a patient has been a long sufferer from 'indigestion,' and the pain, of which there has been most complaint, has been definitely related to meals, if spells of good health have alternated with bad turns, and if during the bad times the hours between two in the morning and before breakfast have been

the best of the twenty-four, then any experienced surgeon will suspect a chronic gastric or duodenal ulcer, and advise operation. The operation might—though in my opinion it rarely does—disclose a cancer, the symptoms of which, unless it is causing obstruction, are less definite. They may be shortly described as 'indigestion' which does not quickly yield to simple remedies, the patients being, moreover, elderly people.

In gastro-intestinal diseases *x* rays and barium or bismuth feeding or enemata have recently proved such important advances it is likely that very early cancers and strictures will be discovered and the presence of ulcers confirmed, so that useless exploratory operations can be avoided.

Certain tumours are precursors of cancer so frequently that special attention should be paid to them and endeavours made to remove them.

Multiple polypi in the rectum and colon, even in young patients, have so often in my experience preceded cancer, that I have a special dread of them. The only case I have cured was by an operation suggested to me by my house surgeon, Mr. Saint. The patient, a boy, had multiple polypi in his rectum and lower sigmoid, many of which had already been excised. He was cured by an inguinal colostomy in the upper sigmoid, kept open for one and a half years. This was in 1910, and the boy remains perfectly well.

Papillomata in the rectum, colon, bladder, or larynx of adults have an equally serious tendency, and predispose to cancer, if they are not already cancerous.

Patients with molluscum fibrosum and neuro-fibromatosis, in my experience, nearly all die of sarcoma.

Tumours of bone are frequently malignant, and *x* rays are of special service in their early diagnosis.

Appearance of Patient.—The general appearance of a patient with cancer may be that of rude health, though in the majority observant friends or relations have noticed before any local signs developed that there had been some 'falling off' or deterioration in condition, some loss of weight, or anæmia, or decrease in vigour, sufficient to suggest something wrong. The 'cancerous cachexia' is too late a sign to be of practical use, and there is yet no reliable laboratory test, such as tuberculin or the Wassermann test, for cancer.

'Neurotics.'

The most difficult problem for the practitioner is to discover what is best for the unfortunate patients who are called 'neurotics.' We all admit that the title is one which covers a multitude of sins and serves as a cloak for medical ignorance, but the attitude taken is a

more satisfactory one than by teaching that underlying every such case there is some condition serious enough to require an operation for its treatment. The gynæcologist has had his turn and has discovered that a weird variety of plastic operations inside and out, and even the removal of the chief pelvic contents, have been a signal failure in effecting the cures promised and hoped for. The general surgeon, by the turn of fashion, is now having these unfortunates handed over to him. Some enthusiasts effect a cure by making, and others by removing, adhesions, and it is difficult, in reading their records—each equally brilliant—to discover a reason for their remarkable results. It appears as if the movable kidney had only to be fixed, or the immovable intestines to be released, to secure that health and happiness are restored, but the choice between the two presents insuperable difficulties. An early experience of my own concerning movable kidney made a lasting impression on me, and gave a bias against the operation of nephrorrhaphy which I cannot yet shake off. More than twenty-five years ago a thin, ailing, intelligent, ' neurotic ' woman came under my care, and I discovered what I thought was a movable kidney, and told her so. She had all the distressing symptoms then believed to arise from that condition. One day, after finding her unusually ill, I read a paper by the late Lawson Tait, saying, in the convincing manner of all he wrote. " there is no such thing as a movable kidney. All the lumps mistaken for this are distended gall-bladders with gall-stones in them." I went to the patient, told her what I had read, apologized for the mistaken diagnosis I had made, and offered to remove her gall-stones by operation. She entirely approved of an operation, and said she did not know whether Mr. Tait was right or not, but she *did* know that the whole of her suffering came from the lump in her right side, and if it could be taken away she felt sure she would be cured. With this opinion I agreed. On opening the abdomen I found the gall-bladder healthy, and the lump a freely movable right kidney, which I excised, as the operation of nephrorrhaphy had not been invented then. Careful macroscopic and microscopic examination proved it to be a healthy kidney, and for a few days after the operation I went about with the unhappy feeling that I had performed a criminal act. The end seemed to justify the means, because, as soon as the patient was well enough, she declared that all her old symptoms had disappeared, that her health had been completely restored by the operation, and that she owed everything to my skill. This happy state of affairs continued for many months, then all her old symptoms returned, and for many years I was glad to go a long way round to escape an interview with her.

On many occasions I have undone adhesions in the abdomen, and seen cases operated on by others, for abdominal discomforts

difficult to assign to any definite cause. Omitting those causing definite obstruction or associated with gross pathological change, I have never been able to satisfy myself that any benefit followed these operations, and patients are often worse after them. It is of interest in this connection to note that Sir Arbuthnot Lane, whose brilliant work has attracted the attention of the whole surgical world, has abandoned attempts to deal directly with adhesions because he has found these operations useless.

In conclusion, then, allow me again to offer a reason for my attempt to give an example of the type of post-graduate teaching that I consider ought to be offered in surgery.

The principles of surgery should be taught to students so thoroughly that they can never forget them. In the limited time at the disposal of practitioners they ought to be given as much information as possible, and their surgical teachers should give the results of their experiences in so practical a form as to serve as a safe guide to a diagnosis which suggests the need for surgical treatment.

NOTES OF A VISIT TO PROFESSOR RUTHERFORD MORISON'S CLINIC AT NEWCASTLE-UPON-TYNE.

(*The British Journal of Surgery*, April, 1914.)

The Royal Victoria Infirmary, situated in Leazes Park, a part of the town moor, is a modern hospital containing 430 beds. It is built on the pavilion system, and consists of eight ward pavilions with the various administrative buildings. The medical wards are on the first floor, the surgical ones on the ground floor. The operating theatres, of which there are four, lie on the north side of the central corridor.

The wards, which are 102 ft. long, 26 ft. wide, and 13 ft. high, give the impression of being well-proportioned; they are heated by means of open stoves and hot-water radiators. The windows have double-hung sashes; the lower sash can be raised several inches so as to allow ventilation at the centre without letting a draught through at the bottom. At the top of each window is a hopper with glass sides. The floors are laid with teak blocks, and the walls are lined with tiles to the height of 5 ft., above which they are cemented and painted.

Each ward pavilion contains twenty-four beds in the main ward, and four in the side wards. There is also a day-room for the use of patients. The lavatories and bathrooms are situated at the end of the wards farthest from the corridor; while the kitchen, Sister's room, small wards, day-room, larder, and linen room are at the corridor end.

The children's wards, of which there are four, are 24 ft. wide, and only contain ten cots. The walls are lined with tiled pictures.

The large operating-theatre is octagonal, with a marble gallery running round the wall, at a height of about 7 ft., for students ; this gallery is entered from the first-floor corridor. The theatre is lit by a large north window ; the roof is of glass, double-glazed ; the walls are of white tiles, and the floor of marble terrazzo. There are the usual sterilizing and anæsthetizing rooms.

The lecture-theatre and class-room are immediately below the large operating-theatre, and are large enough to accommodate one hundred students.

Professor Morison, the late senior honorary surgeon to the institution, had under his charge one large male surgical ward of 28 beds, half of a large female surgical ward of the same size, and six surgical children's cots, a total of 48 beds. During the year 1913 there were performed 8457 surgical operations.

Mr. Morison attended the infirmary every day in the week excepting Wednesdays. His operation days were Tuesdays and Saturdays, and sometimes Thursdays in addition. He taught students on Mondays or Fridays, but the latter was his principal ward-visit day. His arrangements for clinical teaching on Fridays took the form of allotting to each member of his class one of the large number of surgical out-patients who were sent to consult him by general practitioners. Students were given a quarter of an hour to make the most of their case, and then the whole class adjourned to a lecture-theatre, the patients male and female, waiting in adjacent dressing-rooms. In the well of the lecture-theatre is a platform, and this was occupied by Professor Morison, one of the patients, and the student taking that case. The pathological area of the patient was freely exposed, the latter being on a trolley, or a seat, between Professor Morison and the student. The student then gave a diagnosis, which he had to substantiate by stating the symptoms and showing the signs to Professor Morison and the whole class.

A special feature of the ward-visit was the attention Mr. Morison paid to surgical pathology. The pathological specimens from any patient whose case had been the subject of demonstration, were carefully preserved for this Friday class. After the out-patients had been seen, Mr. Morison demonstrated each specimen, recalling the full details of each case.

Visitors are allowed in the area of the theatre, but each must wear a gown without sleeves, a cap and a mask. No special foot-coverings were worn, but the floor was kept damp with a solution of hyd. perchlor. 1–1000.

The patients were anæsthetized in a separate room, wheeled into

the theatre, and lifted on to the table by means of a sheet. Anæsthesia was induced in all cases by chloroform first, and then by open ether. This was followed by intratracheal ether (Kelly). Mr. Morison remarked that he thought this was the best anæsthesia he had used. It appeared to be safe, abdominal movements were much lessened, post-operative vomiting and bronchitis were less frequent than with open ether, and the shock of operation was diminished.

The instruments, which had been previously sterilized, were kept in 1–40 carbolic, and handed by a nurse. Neither surgeon nor assistants had anything to do with the instruments or ligatures in the trays. After use, the instruments were put into a separate bowl.

Catgut was used on every possible occasion, some of it being extremely thick. It is prepared at the infirmary, being first chromicized by Macewen's method, then soaked in carbolic, sterilized by boiling in alcohol under pressure, and finally stored in tinct. iodi in alcohol. During the operation it is kept in a tray of methylated spirit. This mode of preparation of the gut had been in use for eight years, and had given every satisfaction.

For abdominal cases, especially fat or muscular walls, deep sutures of thick silk soaked in tinct. iodi are often used. These remain in for three weeks, the skin sutures, which are so applied as to bring about perfect apposition, being removed on the tenth day.

Dry sterilized towels were used, a large sheet covering the whole patient and an anæsthetist's screen. For abdominal cases, a wet towel wrung out of 1–40 carbolic was spread over the patient's legs for the purpose of laying instruments on.

The lotions, kept in two basins beside the operator and his assistants, were hyd. perchlor. 1–1000, and normal saline.

The mops used were flat pads of gauze, to which porcelain balls about an inch in diameter were attached by an 18-in. tape, to prevent their being lost. Last year, three patients had come under Mr. Morison's care from other hospitals, within a month, with gauzes left in the abdomen. None of them knew why they were ill, or why their wounds would not heal, and in all mops were removed which had been there for months.

The mops were wrung out of hot normal saline; dry mops were rarely used.

Mr. Morison and the house surgeon both changed their clothes before operating; they wore vests, white trousers, rubber boots, rubber overalls, gowns, caps and masks. The sleeves of the gown were detachable, and were worn with india-rubber gloves covering the lower end. The gloves were wet sterilized, and powdered inside with sterile boracic acid.

All patients upon whom an operation was to be done on one side

had the affected side marked with a large cross. Mr. Morison said that mistakes had so frequently been made (he knew of many himself), and the wrong side operated upon, that if the cross was not there the case was sent back to the ward, and the house surgeon had to get out of trouble with the patient as best he could.

Preparation of the Skin.—The operation area is prepared the night before with spirit soap, turpentine, and methylated spirit. Just before the incision is made the skin is washed with Harrington's solution, and then with spirit. Before the operation commences, scratches are

Fig. 77.

made on the skin as a guide to the position of sutures (Moynihan). The dressings are sterile gauze wrung out of alcohol, and abundant corrosive wool outside this.

Case 1.—*Inguinal hernia.*

R. W., age 20, cabinet-maker.

History.—Nine months ago he noticed a lump in the left groin. It had never been strangulated. Suffered from chronic constipation. No chronic cough.

Signs.—Left-sided reducible bubonocele.

Operation.—A 4-in. incision was made over the inguinal canal parallel to a line joining the anterior superior spine to the spine of the pubes. The inguinal canal was opened by division of the external oblique, and the sac, which was empty, was found and separated from the cord.

After the sac had been opened and separated, it was transfixed above its neck, and ligatured twice with thick catgut. The sac was removed, and the stump anchored external to the internal ring by pushing a blunt needle from near the anterior superior iliac spine through the muscles on to a finger in the inguinal canal, drawing the sac sutures through and fixing them to the external oblique. The internal oblique was then sewn down to Poupart's ligament with catgut, one suture passing in front of the outer end of the cord, and four sutures behind the rest.

Mr. Morison pointed out that the most important suture was the innermost, which passed from the conjoint tendon to the inner end of Poupart's ligament, because recurrence was most apt to occur in that situation. The external oblique was sewn up in double-breasted-waistcoat fashion, the lower cut edge being fixed to the posterior surface of the upper flap, and the edge of the upper flap being sewn to Scarpa's fascia over Poupart's ligament. The superficial fascia and fat were united by catgut, so as to obliterate any dead space, and the skin was sewn with subcuticular catgut, two deep sutures of fishing-gut being put in for safety.

Mr. Morison taught that in an operation for inguinal hernia, two groups of vessels and two nerves were encountered, viz., the superficial external pudic and superficial epigastric vessels, and the ilio-inguinal and the genital branch of the genito-crural nerve. The vessels were clamped in Lane forceps, which were taken off before the skin was sutured. If the ilio-inguinal nerve was caught and tied in a suture, this gave rise to considerable and abiding pain ; division of the genito-crural nerve caused paralysis of the cremaster, with the result that the testicle hung low and was liable to be squeezed, especially if the man got on to a bicycle or a horse.

Mr. Morison said that most of the patients operated upon in the infirmary for hernia were miners, whose work was extremely arduous, and recurrence was very probable unless a thorough operation was done. His results showed a recurrence in 2 per cent of cases. The worst subjects were not old men, but fat, muscular young men who were growing fatter. The after-treatment was to keep the patient in bed for four weeks, and then allow him to take two weeks' gentle exercise, after which he might return to work.

A dresser was asked by Mr. Morison what were the essentials for a radical cure of hernia, to which he replied : Removal of sac ; ligature above the neck ; closure of the opening through which it came.

Mr. Morison said that this was the radical cure of abdominal hernia in any situation, but that in the male room had to be left for the cord in the inguinal variety.

Subsequent Note.—The patient returned to show himself six weeks later : scar perfect ; all bandages dispensed with. Is to begin his full work in a fortnight.

CASE 2.—*Ruptured semilunar cartilage.*

J. A., age 39, miner.

History.—Eleven weeks ago, while sitting in a coal-mine with knees extended, a fall of coal partially buried him. His right foot was knocked inwards, causing some, but not serious, pain in the right knee, but no joint-locking. He walked home. He also sustained a simple fracture of the right radius and ulna.

One week later he began to have attacks of pain in the right knee-joint, with synovitis ; the attacks became frequent. No locking until three weeks ago. This occurred when he was turning over in bed, and caused him acute, sickening pain.

Signs.—Spare ; wasting of the muscles above and below the right knee-joint ; tender spot on inner side of patella ligament ; no joint inflammation ; no urethritis ; no other joints involved ; *x*-rays show nothing abnormal.

Diagnosis.—Internal semilunar cartilage of right knee-joint ruptured at time of accident ; no displacement of fragment until three weeks ago.

Operation.—A tourniquet was first applied, and the knee was then flexed to a right-angle on the table. A vertical incision was made down the inner side of the patella, and then inwards and backwards over the inner tuberosity of the tibia. A blood-vessel crossing the incision transversely about its centre was clamped with Lane forceps before dividing it. This vessel was always seen. The aponeurotic capsule was divided, the synovial capsule opened with another knife, and both were reflected backwards. On acutely flexing the knee the internal semilunar cartilage was seen to be fractured longitudinally and fixed at each end, with the separated band lying between the two condyles and closely hugging the internal one—the bucket-handle variety.[1]

The anterior end of the cartilage was removed from its attachment to the tibia ; nearly the whole of the fractured piece, together with the anterior third of the rim of the cartilage, was then excised.

The aponeurotic capsule of the joint, not the synovial membrane, was sewn up with continuous catgut, and the skin in the same manner. In addition, two fishing-gut sutures were used for the skin.

A large dressing was put on, but no splint used. After the bandage had been applied the tourniquet was removed. The dressing was to be left for ten days. The patient was allowed to move the joint when he liked.

Mr. Morison remarked that this was an example of an important class of case, and one to which he had previously drawn special attention from the point of view of employer's liability.

This man's cartilage was fractured by the original accident eleven weeks before.[2] It was not till three weeks ago that the fragment was so displaced as to prevent extension. He had only seen a few of these cases ; but if they were not recognized and the man worked afterwards, it was difficult to believe that the disability after such a trifle as turning over in bed could have anything to do with an accident which had occurred previously.

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[1] "Injuries to the Semilunar Cartilages of the Knee," *Clin. Jour.*, 1913, April 9.

[2] *Lancet*, 1909, Feb. 27.

The usual symptoms and signs of a fractured cartilage with displacement were :—

Acute pain which might be attended by an audible crack ; locking of the joint ; effusion in the joint in a few hours ; subsidence of the trouble, with an interval of *complete freedom* from symptoms ; recurrence on slight provocation.

Locking of the joint usually meant inability to extend it fully, because the anterior end of the cartilage was generally fractured and displaced ; but if the fracture and displacement were posterior, the locking was on flexion.

In the bucket-handle variety of fracture, the joint was not quite normal nor free from uneasiness between the attacks—as in this instance.

Mr. Morison said that he used to sew up the synovial membrane with the capsule, but that the patients often had great pain and distention of the joint. Since he had given up sewing the synovial membrane the patients had been more comfortable.

In all operations he used one knife for the skin, which it was impossible to sterilize, and another for the deeper parts of the wound. He thought a probable reason for the ordinary good results following neglect of this precaution was that individuals were resistant, and had acquired an immunity towards their own organisms which they did not possess towards those from other sources.

Subsequent Note.—Uninterrupted recovery : wound healed by first intention. Left hospital with knee bandaged but without any splint. Later, patient returned to show himself ; he can flex his knee so that the calf of the leg touches the thigh. As instructed, he has practised flexing the knee by sitting on a table with the leg over the edge, so that the weight of the leg produced flexion at the knee-joint. Not at work yet.

Case 3.—*Fractured patella.*

O. T., age 56, fitter.

History.—Is a foreigner. Apparently he 'bumped' his left knee against a wooden plank.

On Admission.—Hæmarthrosis. Transverse fracture of patella with separation of fragments. Lower fragment quite small. *X*-rays confirm this.

Operation.—A tourniquet was applied around the thigh. A large horse-shoe-shaped incision, convex downwards, was made over the lower part of the knee, and the flap was dissected upwards.

Instruments only were used, no hands touching the wound. The clot was gently removed from the interior of the joint with forceps. No lotion was used in the joint, and no mopping of its interior was done.

The fractured bone-surfaces were exposed, and both were found to be covered with flaps of aponeurosis, which were reflected up and down.

The aponeurosis at the sides, which was torn for about 1½ inches, was then brought together by a figure-of-eight suture of strong catgut, one on each side, and the aponeurosis over the patella was joined to the ligamentum patellæ by one strong catgut mattress suture, which brought the broken fragments into firm and accurate apposition.

The wound was closed by a continuous suture of catgut and two sutures of fishing-gut. No drainage was used. A dressing of spirit gauze, covered with a large quantity of corrosive wool, was applied, and the tourniquet removed, after which the limb was placed between two lateral Gooch splints, reaching from the sole of the foot to the perineum on the inside, and the great trochanter to the sole on the outside.

Mr. Morison pointed out that this patient was a very feeble man, much older than his years, and not a good subject for operation: his reason for operation was that no crepitus could be elicited when the fragments were rubbed together, and this meant that the fractured surfaces were covered by the torn aponeurosis, and bony union could not occur. Another definite indication for operation was tilting of the lower fragment, so that its cartilaginous surface faced the fractured area of the upper one.

If the patient had not been so feeble, he would have drilled both fragments and used two catgut sutures to bring them together.

The after-treatment was to keep splints on for six weeks, and then to allow the patient to move his leg for himself. There would be no massage. In less than six months the patient should have as good a joint as ever.

Subsequent Note.—Uninterrupted recovery: wound healed by first intention. Later: firm union of fragments. He can flex the knee to a right angle. Splints were removed a fortnight ago.

Case 4.—*Chronic gastric ulcer.*

W. P., age 38, tobacconist.

History.—Has had 'stomach' trouble for four or five years.

Pain.—Came on about two hours after meals at first, recently about one hour after meals, occasionally immediately after; worse after a heavy meal; is getting more frequent; worse in winter; has occasionally been wakened up with pain about 2 a.m.

Vomiting.—Has sometimes gone for two days without vomiting, and then vomited a large amount (hand-basin full); time varies, sometimes immediately after meals; the vomited matter is usually sour, acid, like frothy yeast, and foul-smelling; always relieves the pain, usually gives complete ease; sometimes self-induced; has been getting larger in amount.

Blood.—One attack of hæmatemesis (coffee-ground) previous to admission; no melæna before admission; has lost over two stone in last four years.

On Admission to Medical Ward.—Emaciated and anæmic; since admission had two attacks of severe hæmatemesis, and almost constant melæna. He is now on rectal feeding.

Signs.—Rigidity of both upper recti muscles, with epigastric tenderness; stomach dilated, the greater curvature being well below the umbilicus;

visible peristalsis seen ; the vomit was coffee-ground in character, alkaline, sour-smelling, and frothy ; it contained free HCl and, microscopically, sarcinæ and yeast fungi were seen ; hæmoglobin, 50 per cent.

Diagnosis.—Active pyloric ulcer adherent to pancreas, with stricture ; dilated stomach.

Operation.—Median incision to below the umbilicus (which was excised by an elliptical incision). The stomach was found to be much dilated, and a large cicatricial œdematous mass occupied the region of the pylorus. This was adherent to the gall-bladder above and to the pancreas behind. The appendix was found to be kinked and adherent ; it was removed. No Lane kink was present. A posterior gastro-enterostomy was done without clamps by the no-loop (Moynihan and Mayo) method. A large opening about 3½ in. long was made, so as to allow for subsequent contraction of the stomach. The pylorus was occluded and depressed by a running silk suture on the anterior surface of pylorus and duodenum, so as to obliterate the outlet and to form a thick pad.

The wound was closed in layers with catgut sutures and some deep sutures of strong silk soaked in iodine. A large dressing of wood-wool was applied. The patient was infused intravenously during the operation.

It was not sufficiently recognized, Mr. Morison stated, that division of a muscle, if properly sutured and if its nerve were not damaged, left no disability. He had divided the rectus femoris above the knee-joint on several occasions, and had found that after healing the divided muscle was as strong as that on the opposite side.

Mr. Morison remarked that there were only two ideal abdominal incisions—one in the middle line, and the other oblique, parallel to and avoiding the nerves of the abdominal wall. When properly sutured, these incisions could be relied upon not to allow of a subsequent hernia, and they were the only ones of which that could be said. The worst incision was one in the semilunar line, and especially below. On five or six occasions he had operated on cases of inguinal hernia after this incision had been made, and which were due to it. They were difficult cases to cure, because nerve-division had made the muscles yellow, fragile, and flaccid.

He believed in a large incision in these cases, so that a thorough examination of the abdominal viscera could be made. In one of his early cases, when he made small incisions, he did a gastro-enterostomy for a stomach ulcer, although he noticed at the time that the jejunum was dilated. He did not explore further to discover the cause of this. The patient was not relieved, and soon died. Post mortem it was found that he had a stricture of the jejunum two feet from the duodeno-jejunal flexure, the result of an old stab in the abdomen.

Later he had two similar cases of dilatation of the jejunum. Both were due to stricture, and multiple peritoneal nodules were present in both. One was tuberculous and one malignant. This was proved by microscopic section of removed nodules. In these cases he did a gastro-enterostomy below the stricture. In the malignant case he saw the

patient six months after the operation, and she appeared then to be very well. Presumably she died soon after, for he had not seen her again. The tuberculous case quite recovered.

He did not know what dilatation of the duodenum meant, as he had never been able to find any cause. It was common in the miserable people dubbed neurotic, who were the curse of surgeons.

Mr. Morison pointed out that the patients who had pain in the early hours of the morning usually had—as in this case—an ulcer, either gastric or duodenal, adherent to the pancreas.

He believed in a large dressing of wool, as it kept the patient warm, and allowed of comfortable compression and some distention without severely tightening the bandage. In cases like this, where there had been considerable hæmorrhage, acute dilatation of the stomach was very liable to occur, and quite suddenly, even so long as two weeks after operation. If it were not recognized, the so-called vicious-circle vomiting developed and the patient died. Early recognition, followed by stomach lavage, usually worked a miracle. The patient was immediately restored, and as a rule required no further washing out.

This patient was infused intravenously owing to an increase in the pulse-rate. His general rule is that if the blood-pressure falls below 100 during the operation, or the pulse rises above 100, the patient should be infused.

He had never used clamps for gastro-enterostomy, being deterred by fear of hæmorrhage into the stomach after the operation. He liked to cut and tie the bleeding vessels and feel safe. It would be wrong to say, when surgeons, much better qualified than himself to offer an opinion, advocated and used clamps, that this was a mistake, even if he thought so. The clamp operation was easier and cleaner, but as none of his patients had died of peritonitis after the operation, he thought that careful packing could prevent this. This was the ninety-eighth case since 1911 on which he had done gastro-enterostomy for simple ulcer and its complications, and of these only one had died, from hæmorrhage, ten days after the operation. That patient had multiple ulcers in the stomach and duodenum. It was worth noting that during this time, at least three patients, apparently no worse than many of those operated upon, had died suddenly the day before that fixed for operation, so that he was fortunate in his statistics this time!

Subsequent Note.—Uninterrupted recovery; never vomited after operation; was eating minced beef without any pain or discomfort after tenth day; wound healed by first intention.

Case 5.—*Abdominal pain regarded as gall-stone colic.*

G. S., age 33, housewife.

History.—For ten years had suffered from abdominal distention after a heavy meal. Attack of acute pain fourteen days ago. Gradual onset in bed, with pain in lower abdomen ; it became acute, made her shout and shiver, but she did not vomit. It did not catch her breath. The acute pain lasted for about twenty-four hours ; it gradually went away, but was replaced by soreness.

Thirty-six hours after onset of the first attack she had a further acute attack. Sudden onset, with acute pain in right hypochondrium, radiations to right. Caught her breath. Lay still in bed ; dare not move. No vomiting. Acute pain replaced by right hypochondrium soreness.

Never been jaundiced ; no urinary frequency ; had had epigastric pain immediately after food ; no hæmatemesis, or melæna.

On Admission.—Spare.

Signs.—No jaundice ; tenderness over gall-bladder ; *x*-rays show no abnormal shadows in the gall-bladder and renal areas.

Diagnosis.—Gall-stones ; cholecystitis.

Operation.—A transverse incision was made midway between the costal margin and the iliac crest, and the abdomen was opened through the oblique and transversalis muscles. In this case the sheath of the rectus was divided but not the muscle. It was rarely necessary, Mr. Morison said, to divide the muscle.

For this incision the patient was bent laterally, so as to open up the space between the costal margin and the iliac crest. The pouch between the liver above and the transverse mesocolon below was opened up and packed with a large gauze mop.

No stone was found in the gall-bladder, which appeared to be, and felt, normal. The appendix was found to be kinked and thickened at the end. It was removed and found to contain some fæcal matter. The mucus membrane was swollen. No Lane kink was present, and nothing was found wrong in pelvis, kidneys, or ureters. The stomach was reddened and the duodenum was much dilated, but no cause for this was found.

Mr. Morison could not explain the condition ; but he felt pretty certain that although the appendix had been removed, this was not the cause of her trouble. It was an unsatisfactory class of case, and one not at all likely to be benefited by surgical treatment.

He had introduced this transverse incision many years ago, and had frequently advocated it. So far as he knew, no other gave such a good exposure of the biliary tract, or made operations upon it so easy and safe. He only used the longitudinal incision through the rectus when the diagnosis was not clear and gastro-enterostomy might be needed.

The muscles were united in two layers by catgut sutures and some deep sutures of silk soaked in tinct. iodi. If the gall-bladder had to be drained, the tube was brought out at the posterior end of the wound. The gall-bladder was never sewn to the parietal peritoneum in his cases.

Subsequent Note.—Uneventful recovery : wound healed by first intention.

Case 6.—*Epithelioma of lip.*

T. W., age 60.

On Admission.—An epitheliomatous ulcer at the left angle of the mouth and a mass of large malignant glands in the corresponding side of his neck.

Mr. Morison said that, as a rule, malignant ulcers of the face were unusually benign, but that those at the angle of the mouth were an exception, and possessed a malignaney equal to those of the tongue.

Operation.—He first did a 'block dissection' (Crile) of the neck, by one incision extending from the mastoid process to the claviele at the back of the sternomastoid musele, and a second from the point of the chin to the centre of this.

After reflecting the skin-flaps, he divided the sternomastoid above and below, and excised the fat and lymphatics with the internal jugular vein and the separated musele. Then the external carotid artery was ligatured between the lingual and facial branches, and the cheek-growth was freely excised.

The neek wound was closed with catgut interrupted sutures (to allow of drainage), no drainage-tube being used.

Subsequent Note.—Good recovery: wound healed by the time he left hospital a fortnight later.

ANEURYSMS.

(*The British Journal of Surgery*, April, 1914.)

In the whole of surgery I know of no more uncertain disease than aneurysm. Occasionally the most trivial help will eure it. At other times it has all the malignaney of the most malignant tumours.

Traumatic Aneurysms of the Radial and Popliteal Arteries.

Radial (*Excision*).—I have had some experienee of traumatic aneurysms in the hand and its neighbourhood, and this (*Fig.* 78) I

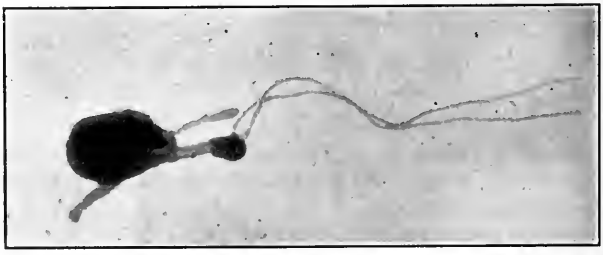


Fig. 78.—Traumatic aneurysm of radial artery, with portion of embedded metal.

regard as a typical specimen. It is common to have a small foreign body such as a piece of steel stieking into the side of the artery, as in this instanee. The aneurysm has been excised.

Popliteal (*Matas' Operation*).—Another variety of traumatic aneurysm has come under my notice, and I shall perhaps best convey what I know of it by relating a case.

The patient, a labourer, age 65, was recently admitted to the Infirmary. Twelve years ago he strained his leg seriously in a cycle fall. A sudden sharp pain was felt on the inside of his right knee, and a lump developed. At first it was the size of a walnut. It caused little trouble until six months ago. Since then the leg had been painful, but not sufficiently so to lay him up. Suddenly, four days ago, the leg and foot became numb, painful, and cold.

He had an aneurysm about the size of a cocoanut in the popliteal space, with the typical expansile pulsation, varying much in its vigour from day to day. No pulsation could be felt in the vessels below the aneurysm.

At the junction of the upper and middle third of the right leg there was a regular dark line, and below this the skin was dusky, livid, cold, and insensitive. The superficial veins were enlarged. Pressure on the leg showed that there was still some circulation in it, but very little. The limb was rubbed with turpentine and then with spirit, then dusted with boracic acid. Boracic lint was put between the toes, the leg was wrapped up in cotton-wool, and the limb elevated.

Patches of gangrene developed on the outer aspect of the leg about the middle, on the heel, and on the first, second, and third toes.

Operation (April 12, 1913).—Matas' obliterative operation was done, silk being used for the entrance and exit of the artery into the fusiform sac. The cavity of the sac itself was obliterated by a series of layers of continuous catgut suture. The operation had no ill effect on the gangrene.

On May 7, 1913, the first, second, and third toes were amputated. A gangrenous patch about the size of a five-shilling piece was excised from the heel, and a Wolff's graft sutured in its place. Nothing was done to the gangrenous patch on the outer side of the leg, from which a slough had separated. The wounds on the toes and the grafted heel united by first intention, and the patient was sent home a month later, well, except for an ulcer about the size of a half-crown on the outer side of his leg.

It would have been impossible by any other operation to obtain such a result in this case. Excision of the sac would have involved removal of the popliteal vein which was adherent to it, and a great disturbance of the surrounding parts, because the sac was of such large size.

The sac was found to be partly filled with fluid blood, with a large round ball of loose clot in it.

The patient was neglected after going home, and he developed a

septic cellulitis from infection through the ulcer. He was admitted ill on August 22, rather more than four months after the Matas' operation, and amputation through the knee was performed on August 23.

Dissection of the aneurysm showed that the sac had been entirely obliterated. The silk sutures could still be seen at either end of the sac. All signs of any catgut had disappeared. The popliteal artery and its proximal end were healthy and patent down to the sac. At its distal end it was filled with clot.

Leaking Aneurysm of the Subclavian Artery—Ligature of Innominate and Right Carotid Artery.

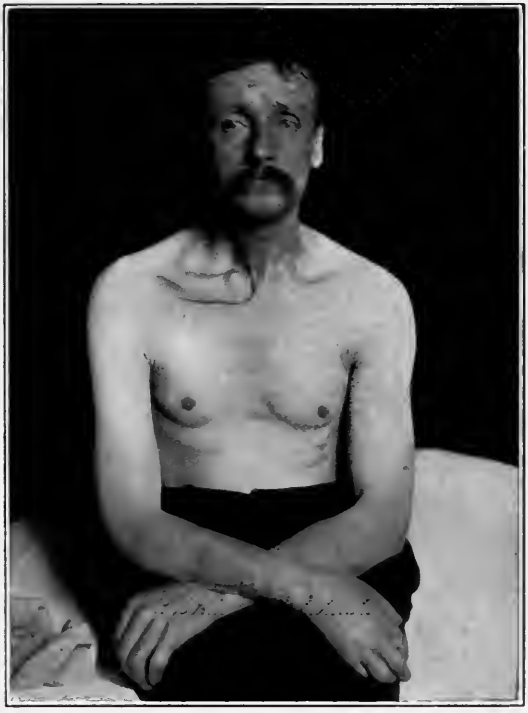
The patient, a male, age 51, was transferred from Dr. Drummond's ward to me in January, 1912, with an aneurysm of the subclavian artery, which was leaking and rapidly increasing in size. A pulsating swelling occupied the lower part of the right side of the neck (*Plate XXXIX*A. It extended nearly as far as the middle line, over the shoulder on to the deltoid, below the clavicle to about the level of the 3rd rib, and behind round the scapula. Pulsation, a thrill, and a systolic murmur were present all over the swelling. There was excruciating pain, with numbness and loss of sensation down the right arm, which was swollen and had enlarged veins.

I proposed to Dr. Drummond that I should put a temporary ligature round the innominate artery as the first step, then cut down upon the clavicle, turn out the extravasated blood, and if possible treat the aneurysm by Matas' method. I commenced the operation with that intention.

Operation (July 20, 1912).—An incision was made along the anterior edge of the right sternomastoid to the sternoclavicular joint, and then outwards along the clavicle (*Plate XXXIX*B). The skin flap was turned back, and the sternal and a portion of the clavicular attachment of the sternomastoid were divided. It was then found that the aneurysm probably involved the second and third parts of the subclavian artery. The innominate was easily exposed and separated posteriorly, internally, and anteriorly, but on the outer side it was adherent, and had to be dissected off the surrounding tissue. A patch of disease in the vessel wall was seen to be the cause of this. In course of the separation a hole was accidentally made in the vessel. Mr. Angus, who was helping, skilfully occluded this with a pair of clip forceps, and I then passed a thick silk ligature round the vessel below the forceps. After consultation with my colleague, who gave me invaluable assistance, I decided to give up the original programme, and I occluded the innominate artery with thick soft silk ligatures tied quite tightly above and below the opening. I then tied the right

PLATE XXXIX.

A—ANEURYSM OF SUBCLAVIAN ARTERY.
Before Operation.



B—THE SAME PATIENT AFTER OPERATION.
Note the incision.

common carotid with thick catgut. After applying the ligatures I covered up the wound, took a piece of fascia lata from the man's right thigh, and wrapped this round the ligatured vessels. The incision was closed without any drain.

After recovering consciousness, the agonizing pain from which he had previously suffered was gone. Instead of this there was complete anæsthesia and paralysis of the arm. This continued to be complete for a fortnight, then some feeling began to return. The wound healed by first intention, and remained healed for six weeks. Then a small bleb formed at its lower extremity, and this continued to leak a little serous discharge for two months, when it permanently closed.

The patient is now living at Hull, and Mr. Upcott has been kind enough to interest himself in him on my behalf. He tells me that the condition of the arm is improving, and that the man is in good condition.

I felt no right to expect that this man would be cured by so unpromising an operation, but as I have suggested, the happenings in aneurysm are often the unexpected.

PLASTIC OPERATION ON THE HAND OF A YOUNG BOY.

(*The British Journal of Surgery*, April, 1914.)

A boy, age 4, at the age of 2 had his hand caught in a reaping-machine. This had torn the skin off the whole hand and had amputated the phalanges of the digits and thumb close to the metacarpo-phalangeal articulation. At the time I first saw him the stump of his hand was covered with granulation tissue, and there was no skin below the wrist. At first sight amputation of the hand appeared to be the only resource; but remembering the trouble I had had with previous amputations in young people, knowing that the production of a conical stump would necessitate re-amputation more than once before he reached adult life, and recognizing that if the hand could be covered with skin it might still make a useful appendage, I determined to do a plastic operation.

I first made a pocket like the side pocket in trousers on the anterior abdominal wall, and placed the entire hand in this, sewing the skin of the abdominal wall to the skin of the wrist. To prevent adhesions of the hand to the abdominal wall, boracic lint was introduced between the two.

The first shock I got was to find what a large amount of separation of the abdominal skin I had to make in order to get the hand comfortably under it.

A fortnight later, I cut along the upper part of the pocket and turned a flap on to the palm, leaving the hand still attached to the lower part of the flap. The upper flap sloughed almost entirely. I then waited a month and cut along the lower edge of the pocket and turned this flap on to the palm. To my horror this also sloughed, so that only the back of the hand was covered, and fully half of the abdominal wall was bare. The condition then looked almost desperate.

The next thing I did was to make a flap from the buttock and cover the palm of the hand with this. This step, which ought to have been the first, was an immediate success, and the hand was now entirely and satisfactorily covered with skin. In order to help the bare area on the abdominal wall to contract, a large flap was turned down from the chest. The ultimate result was beyond my expectations (*Plate XL*).

The hand is like a boxing glove; there is some movement of the phalanges and the hypothenar and thenar eminences under the skin, and the *x*-rays (*Plate XLIA*) give the impression that further growth of the hand may make it even more useful, as the muscles were not destroyed. By strongly flexing the hand stump and the forearm, he can hold gross articles, and he uses the stump for wiping his face, doing small jobs such as this quite naturally.

IMPACTED TOOTH-PLATE IN THE ŒSOPHAGUS: DEATH FROM SECONDARY HÆMORRHAGE ONE MONTH AFTER REMOVAL.

(*The British Journal of Surgery*, No. 5, 1914.)

History.—M. S., a married woman, age 60, two years ago swallowed a vulcanite tooth-plate with one tooth on it. The immediate symptoms were a choking feeling and dyspnœa, but no cough. She went to a hospital and was *x*-rayed; a probang was used, but after staying a week she was discharged, as an attempt to remove the plate was considered too dangerous. Curiously enough, for a year after this she had little trouble, provided she confined her food to fluids; then her voice began to get hoarse. For three months before admission she had increased difficulty in swallowing, and fluids were apt to regurgitate through her nose. For six weeks she had been troubled by attacks of coughing when attempting to swallow food. She had occasionally brought up food and matter.

On Admission.—Her temperature was 99° F., pulse 72. She was stout and flabby, but looked in fair health. Her complaint was a feeling of something sharp sticking in her throat, and she pointed to a spot below and behind the suprasternal notch.

Signs.—Nothing could be felt on external examination. *X* rays showed a foreign body in the œsophagus just behind the arch of the aorta, between the fourth and fifth dorsal vertebræ. A bismuth pellet stuck above the obstacle, and moved away from it on coughing. Dr. Whillis examined her

PLATE XL.

Shows flap from chest. Contraction has drawn the chest scar on to the abdomen.

Note scars on abdomen and buttock.

PLATE XLI.

A—Condition of the hand as shown by a skiagram, May, 1913.

B—The Patient at the age of 4½ years.

under an anæsthetic with the œsophagoscope, and saw and got hold of the tooth-plate in the position indicated. He found it embedded in granulation tissue, and so firmly fixed that he could not move it. The attempt caused active hæmorrhage, and it was followed by a week of febrile illness, with cough and purulent bloody expectoration.

Operation (Mr. Morison. November 25, 1913).—Intratracheal ether anæsthesia was employed. An L-shaped incision, with vertical limb along the inner edge of the left sternomastoid and horizontal limb along the clavicle, was made. The sternal and clavicular attachments of the sternomastoid were divided, and the œsophagus was exposed by drawing the thyroid gland inwards and the carotid sheath outwards. The wound was now packed with gauze wrung out of tincture of iodine, and the œsophagus was opened on a sound introduced through the mouth. On passing a finger into the thoracic œsophagus, the edge of the tooth-plate could be touched, and forceps, guided down by it, gripped the plate. It was so firmly fixed that no impression could be made upon it. Still keeping it fixed, a second pair of strong forceps, then a third, were made to grip it, and by steady rocking traction, after prolonged and patient effort, a grape stone first, then the tooth-plate, were loosened and extracted. There was very little hæmorrhage, and the patient appeared to be no worse than when the operation was begun. The opening in the œsophagus was closed with a continuous catgut suture, and a broad strip of the sternomastoid muscle was separated, and sutured over the gap. A pack of iodoform gauze was placed over this, and the wound was closed except for three-quarters of an inch near the clavicle, where the iodoform gauze protruded. Before the opening in the œsophagus was closed, a long indiarubber tube had been put into the stomach through the nose for feeding purposes.

One object of dividing the sternomastoid was to allow the finger to reach to a greater depth, and it was successful in this ; another was to prevent any pocket being left which might retain septic fluids. The iodine gauze was used as a protection against virulent sepsis from the open infected œsophagus.

For the first three days only sterile water was given through the tube, and nutrient enemata were used. From the first there was a little discharge from the wound, but no constitutional disturbance. On the third day the gauze packing was removed, and the wound was syringed with peroxide of hydrogen, which was repeated twice daily.

On December 5, coughing was brought on each time the patient was fed through the tube, and there was slight hæmoptysis. On December 6, the tube was removed, and the patient was fed by the mouth. A very small quantity of what she took escaped through the wound. On December 8, a large stomach-tube was passed without difficulty. On December 9, she was reported as looking and feeling well. Her temperature and pulse had never deviated from normal, there was a very small discharge from the wound, and she was taking minced meat, milk puddings, and other soft food freely.

After-history (Note by Mr. Willan).—The after-history of this patient is that of a surgical tragedy. On December 20, there is a note to the effect that the wound is now only the size of a sixpence, quite clean, and there is no discharge ; patient very fit.

On December 22, one month after the operation, she was suddenly seized with hæmoptysis, and though she expectorated only about a cupful of bright red blood, there were symptoms of internal hæmorrhage, and she

died in an hour. Before this seizure her recovery seemed to be assured, and her death came as a shock to everyone.

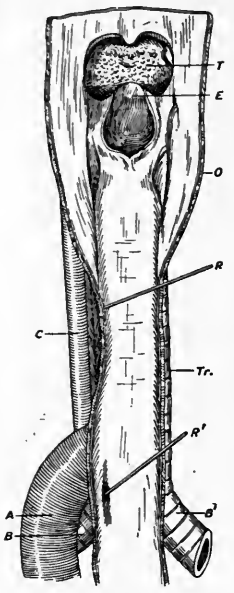


Fig. 79.—Diagram to illustrate the post-mortem conditions. (T) Tongue; (E) Epiglottis; (O) Wall of œsophagus cut open from behind; (R) Rod into left common carotid—site of œsophagotomy; (R′) Rod into left bronchus—site of tooth-plate; (C) Left common carotid; (Tr) Trachea; (B B′) Left and right bronchus; (A) Aorta.

Pathology (post-mortem notes by Dr. Sewell).—M. S., age 60. Date of death, December 22, 1913. Clinical diagnosis: ulceration of aorta. Pathological diagnosis: secondary hæmorrhage from common carotid.

All the organs in thorax and abdomen were normal, except the following:

Œsophagus.—There is a small sinus leading from the external wound into the œsophagus, immediately above the sternoclavicular joint. The external opening of the sinus is surrounded by granulation tissue, and is almost healed. In the deeper part of the sinus there is some recent blood-clot, and there is a plug of ante-mortem thrombus on the wall of the common carotid artery as it lies against the wall of the sinus. The ante-mortem clot partially blocks a round hole into the artery about $\frac{1}{16}$-in. in diameter; the edges of the perforation are clean-cut through all coats of the vessel. On a level with the lower border of the arch of the aorta there is a small diverticulum in the œsophagus, admitting the tip of the little finger. At the bottom of the diverticulum is a small sinus leading into the left bronchus. The wall of the diverticulum appears to be covered with epithelium, and there is no sign of recent inflammatory reaction (*Fig.* 79).

Lungs.—Both lungs are mottled with small hæmorrhages, evidently from inhaled blood. There is very well-marked hypertrophic emphysema. There is some recent blood-clot in the larger bronchi on both sides, particularly on the right.

Stomach.—This is distended, and filled with recent blood-clot. There is no lesion of the mucosa.

Small Intestines.—The upper part of the small intestine contains some blood.

1915

SURGICAL TREATMENT OF ANEURYSM.

(*Index of Treatment*, 7th Edition, 1915.)

A brief consideration of two conspicuous facts in connection with the natural history of aneurysm will at once lead us to the subject of treatment. One of these is the general tendency which exists towards rupture of the sac. It emphasizes, of course, the necessity for surgical interference whenever possible. The other is that spontaneous cure can occur. The methods by which this is brought about in nature are precisely those which we endeavour to reproduce artificially by means of surgery. There is no method of treatment known to us which is not an imitation of some strictly spontaneous curative process. Nature's means of effecting a cure, and our imitations of them, may be thus enumerated and compared. They are :—

1. Spontaneous deposit of clot in the aneurysm brought about by diminished flow through the vessel, or disturbance of clot causing a block in the afferent or efferent vessel. In treatment, compression or ligature of the vessel, and manipulation for the detachment of emboli, represent these processes.

2. Suppuration and gangrene, with obliteration of or destruction of the sac. These are imitated by the Matas operation or by excision.

3. Pressure on the artery of supply by the aneurysmal tumour. This is represented in treatment by flexion of the limb.

4. Inflammation round the sac, which spreads to it and causes thrombosis. A counterpart of this condition is obtained by means of irritating injections around the sac.

The most important, because the safest and most generally applicable, methods of treatment are those which bring about active or passive clotting in the aneurysm, through lessening or arresting the circulation in the vessel above, and in the tumour. Certain methods which have been employed, but are now abandoned or seldom used, may be first mentioned. They ought not to be lost sight of, for some of them may, and probably will, in the future prove to be capable of more successful application than in the past, and history has revealed in surgery, as elsewhere, a well-known tendency to repeat itself.

Injection of the Sac by Coagulating Fluids has offered most promise, but the risks of embolism, inflammation, and sloughing of the sac

have been found dangers serious enough to discredit the method. Tincture of perchloride of iron injected drop by drop from a screw syringe has been most commonly used.

Introduction of Foreign Bodies into the Sac.—Wire, horsehair, silkworm gut, catgut, etc., have been introduced into the sac with the object of producing coagulation of its contents. In some cases metallic wire and electrolysis have been combined, and a very few favourable results have been recorded. This operation should be reserved for otherwise hopeless cases.

Galvanopuncture has proved no more successful in the treatment of surgical aneurysm than in that of internal cases. It may be well to mention that many deaths have resulted from surgical defaults and from cellulitis in the neighbourhood of the punctures.

Parenchymatous Injection of Ergotine.—The mixture suggested is: Extract of spurred rye, one part; rectified spirit and glycerin, of each one and a half parts. This is injected with an ordinary hypodermic syringe (10 to 15 min.) into the tissues surrounding the aneurysm, but not into the sac. If after two or three injections there is no improvement, it is useless to persevere.

Manipulation.—The sac is emptied by gentle and continued pressure. Its walls are then rubbed together in order to detach some portion of the lining clot, in the hope that the afferent or efferent vessel may be plugged by it, or that the detached clot should increase its size *in situ* by fresh deposit upon its surface. The fear of embolism has interdicted this form of treatment.

Needling of the Interior of the Sac is the most promising of all methods under present consideration, and is specially likely to prove a useful addition to methods of compression.

I.—Pressure Treatment.

Of all means, apart from operation, pressure is by far the most important in the treatment of aneurysm. The compression may be applied *directly* to the aneurysm, or *indirectly* to its vessel of supply.

Direct Pressure.—Used in unsuitable cases, this has done much harm. On the other hand, it has proved most serviceable as a curative agent in cases where clotting was first brought about by indirect pressure, or by ligature above the sac, but where, nevertheless, pulsation had returned later on. Careful watching is necessary, and the pressure must not be severe enough to cause sloughing or ulceration of the skin over the sac.

The application of this method of treatment, say to a popliteal aneurysm, would be as follows: The limb is bandaged from the toes to below the knee, a well-padded splint is fixed to the front of the leg and thigh, reaching from the groin above to the ankle below, and

leaving the aneurysmal tumour and popliteal space exposed to view. A thick compress, such as a well-wrung sponge, should be firmly but not tightly bandaged as a pressure pad over the swelling, and the whole limb should be elevated to at least half a right angle. The toes below should be frequently examined to determine the condition of the circulation. Pain of any severity demands removal of the bandages.

Indirect Compression.—This being the most important method of treatment apart from operation, its principles are to be remembered and should be considered in detail.

Either by fingers or instruments the circulation can be pressure-controlled, either on the proximal or the distal side, in the majority of aneurysms.

By pressure on the proximal side control may be made complete or incomplete. The object of the former is to fill the sac with clot suddenly (the passive clot); of the latter, to allow of the gradual deposition of laminated clot (the active clot). Complete control is usually so painful as to require anæsthesia, and it may be some hours before clotting in the aneurysm occurs. If hardening of the aneurysm shows that consolidation is taking place, the case is hopeful, and with care it is likely that a cure will be brought about. So soon as consolidation has occurred, the pressure may be slightly relaxed, but it should be maintained in such a manner as to diminish the force of the blood-current for at least five hours, during which the newly-formed clot has a chance of consolidating. Even after definite hardening and arrest of the pulsation in the aneurysm, it is possible for the clot to be dissolved and washed away, and for pulsation to return. Rupture of the aneurysm has been known to occur shortly after the commencement of this treatment, and a rapid increase in the growth of the swelling is a danger signal which must not be allowed to pass unheeded.

To carry out this treatment satisfactorily relays of assistants are required. There should be one to observe the condition of the aneurysmal tumour, a second to compress the vessel, and a third ready to take the place of one or other when fatigued. A shot bag or other weight suspended over the fingers is an aid, but the duties are nevertheless so fatiguing that it is necessary to have a change of assistants every three or four hours. The patient ought to lie comfortably, and the surface points over which pressure effectually controls the circulation should be marked out as an aid to relieving the skin from too continuous pressure on one spot.

It is impossible to predict the cases in which this treatment will succeed, or how long it may require to be continued.

The chief advantages of digital over instrumental pressure are,

that it can be more easily regulated, because it allows of slight changes in position of the pressure-points upon the skin, and so diminishes the risk of pressure-sore; that it is less painful; and that it gives better opportunity for avoidance of pressure on the accompanying vein. It is chiefly applicable in cases of high carotid, axillary, femoral, popliteal, and brachial aneurysms. Pressure can be kept up so long as it is borne without great inconvenience, but it is usually necessary to discontinue it at night and allow the patient to sleep. During the intervals of rest a supporting pad and bandage may be worn in order to diminish the activity of the circulation in the aneurysm; or in the case of a popliteal, or of a brachial aneurysm at the bend of the elbow, flexion of the limb secures the same result. Success may be attained by this method after months or even years of trial. The greatest success has followed continuous pressure and entire arrest of the circulation through the aneurysm for a limited number of hours.

Many instruments on the tourniquet principle have been employed in place of fingers to compress the artery while avoiding pressure on any accompanying vein, and allowing, usually, of the passage of a continuous weak and diminished stream through the sac. When using such instruments the limb below the aneurysm should be bandaged, and the contact point of the pressure-pad shifted from time to time to prevent damage to the skin.

Cure may be gradual, as shown by the aneurysm getting harder, and pulsation and expansion diminishing ; or it may be sudden from filling up of the sac with clot. The patient requires careful and constant skilled supervision. The most courageous and obedient are apt to lose patience when restricted to one position in bed, while they are enduring pain and suffering from loss of sleep and exhaustion. The use of morphia or of some other sedative is necessary in the majority of cases, and even with these aids it may still be impossible for the patient to tolerate the treatment.

Rapid Pressure Method.—This was first applied to the abdominal aorta by Dr. William Murray, of Newcastle-on-Tyne, and with success. It has since been used for aneurysms of the limbs. A degree of pressure sufficient to arrest pulsation in the sac is brought to bear on the vessel above the aneurysm for a period varying from eight to eighteen hours. Few patients can tolerate the necessary pressure without narcotics, and if morphia does not suffice it is necessary to use chloroform, though the anæsthesia need only be light, and can be maintained for several hours if opportunities for feeding are provided for.

Reid's Method.—The principle in this method is to produce rapid coagulation of the blood, which is made to fill the aneurysm and its

vessel of supply. Taking popliteal aneurysm as an example, it is carried into effect thus: An elastic bandage is firmly applied from the toes to the lower border of the tumour; a second from a short distance above the tumour to the thigh, leaving the aneurysm and a small portion of its vessels unemptied and unsupported; then above the upper bandage an indiarubber tourniquet is fixed round the limb, firmly enough to arrest the circulation, and the bandages below are removed. The tourniquet must be kept in position for an hour, during which the limb should be pulseless. Meanwhile the aneurysm must be carefully watched, and if it enlarges, support must be given to it by pad and bandage. Before removal of the tourniquet, arrangements will be made for compression of the artery above by digital or instrumental pressure. For aneurysms higher up than in the instance we have been considering, the use of a tourniquet may not be possible; the artery above is then controlled by digital pressure. Digital pressure is also to be maintained whilst the tourniquet is removed, when the surgeon who is feeling the aneurysm dictates how much the pressure is to be relaxed. If the tumour appears to have consolidated completely, a continuous pressure on the femoral artery for three or four hours will suffice to cure it in a majority of cases, but the circulation should be lightly controlled by digital pressure for three or four days. If some pulsation be still perceptible, the cure may be completed by direct pressure on the aneurysm, as previously described; or, if no effect have been produced, the attempt should be given up for the time, and another made after a week of rest, or some other method of attack chosen.

In the early stage of the application much pain may not be complained of, but in a short though varying time it becomes intolerable, and either morphia, or chloroform, or both, are needed. Careful watch must be kept on the pulse as a guide to the state of the general circulation, and on the toes in order to detect the premonitions of gangrene.

Compression by Flexion of the Limb.—In aneurysms, by choice at the bend of the elbow or in the popliteal space—especially of the sacculated variety, and with thick sac wall—if moderate (not forcible) flexion of the limb produces arrest of pulsation, a cure can be brought about by maintaining that position. The same method can aid the cure in consolidation started by other means.

As regards selection of cases, fusiform aneurysms are never favourable; sacculated aneurysms, only when the mouth of the sac is not large enough to allow of active circulation in the tumour; popliteal and brachial (at bend of elbow) are the cases most suited to pressure by flexion of the limb. It is to be avoided in cases of thin-walled aneurysms which are increasing in size. Those in the groin and axilla

are seldom benefited by it, and large aneurysms in the groin have been ruptured by flexion of the hip.

Pressure on the Artery above, of such degree as to diminish but not to arrest the circulation, is most likely to succeed when the swelling is hard and the pulsation not forcible, i.e., where some clot has already been deposited in the sac, and when the patient is intelligent and placid enough to aid in the treatment.

Total Arrest of the Circulation by pressure on the artery of supply is used in cases of abdominal, inguinal, and carotid aneurysms, i.e., in situations where prolonged pressure cannot be borne, and where the artery can be effectually compressed against a bony prominence. It has also been used successfully for aneurysms of the limbs of patients unable to tolerate the more gradual method. The elastic bandage and tourniquet method is useful in recent aneurysms which are not too rapidly increasing in size and are not too thin-walled, and where the heart is not diseased and the arteries are not exceptionally rigid.

The objections to pressure treatment are :—

1. That it is painful. Some patients cannot bear it in the most moderate degree, and all find a prolonged course so exhausting as to be almost, if not quite, intolerable.

2. That it may not cure the aneurysm. Even after months of determined effort and painful experience, a considerable proportion of patients will not be cured.

3. That after ' cure ' there is some tendency to relapse. It may be after a few hours or after a few weeks that pulsation returns in the aneurysm.

4. That the treatment is dangerous : (*a*) Rupture may take place soon after the treatment is commenced, or rapid extension of the swelling point to its probable occurrence ; (*b*) Gangrene of the limb below may occur, probably in some cases from pressure involving the vein as well as the artery, though it is only fair to state that gangrene is a danger common in greater or less degree to all forms of treatment.

5. Suppuration of the sac may happen in cases where the aneurysm has been suddenly ' cured ' by the formation of a passive clot.

6. Sepsis. All sorts of septic-wound complications have followed sores produced by too active or too prolonged pressure over the vessels.

7. Subsequent operation may be made more difficult owing to the formation of pressure sores ; or because pressure may have increased the collateral circulation to such an extent as to make operation a failure ; or through the vessels being so matted to their

surroundings after prolonged pressure as to make ligature a serious and difficult proceeding.

It may be said in conclusion, that while these methods have all proved useful in the past, and in days when operations were dreaded by patients on account of pain and by surgeons through fear of sepsis, their scope now has become greatly limited, and their use restricted to exceptional cases which promise to respond readily to such treatment.

II.—Operative Treatment.

The 'Matas' Operation.—The design of this, for the present the ideal operation, is to open and empty the sac, and in fusiform aneurysm to obliterate it by a series of tier sutures, but in saccular ones to close the opening into the vessel, and then obliterate the sac by tier sutures, leaving a sufficient channel for the circulation. The operation produces the same result in a quarter of an hour as the processes of nature would take many months to accomplish. I am now convinced that this is, so far, the best operation devised for the cure of aneurysm, when satisfactory control of the circulation, as in the limbs, can be effected.

Suture of the Aneurysmal Openings into vessels, after the separation of the latter by dissection, has met with its most useful application in the case of arteriovenous aneurysm, but for both these new methods there will be a larger place in the future.

Excision of the Sac.—My last experience of excision of a popliteal aneurysm has made me less enthusiastic than I then was as to the universal applicability of the popular method of excision of the sac.

The patient was a vigorous-looking man with a small but leaking popliteal aneurysm, which was easily dissected out. The artery above the aneurysm was so soft and brittle that a thick catgut ligature cut through it like cheese. Another was applied higher up. This held. I was so impressed by the brittleness of the vessel that special nurses were told off to watch for hæmorrhage. The third day after the operation profuse hæmorrhage occurred, and the femoral artery was successfully tied in Hunter's canal. On the following day gangrene of the foot had set in, and amputation was performed through the thigh. The patient recovered, but lost his leg. Further experience has taught me that this man could have been safely cured, and that his leg would have been preserved, by the obliterative endo-aneurysmorrhaphy method of Matas. The case recorded is of interest, as it emphasizes the old view, which has latterly been ignored and even denied, that the vessels in the neighbourhood of the sac are occasionally so brittle and diseased that there is danger in applying a ligature to them.

Statistics show the safety of excision of the sac. It is also proved that there is less chance of gangrene following it than is the case with an operation by ligature; that the cure is certain; and that no after-troubles, such as arise from the presence of a shrunken sac, are possible. The most brilliant application of this method of attack has been found in the treatment of ruptured diffuse aneurysms of the limbs where amputation used to be the only alternative. By turning out the escaped blood and finding and excising the aneurysm, many of these serious cases can be brought to a successful issue. Even in these cases the operation has been displaced by the operation of Matas, which can be done without serious disturbance of the surrounding parts.

Ligature of the Artery of Supply.—This may be (1) *Proximal*, immediately above the aneurysm, or some distance above it; or (2) *Distal*, below the aneurysm.

1. *Proximal Ligature.*—In all but exceptional cases, the nearer a ligature can be applied above the aneurysm the better, so that the obstruction in the aneurysm and that in the vessel affected by the ligature may combine. The immediate effect of the ligature is to arrest pulsation in the sac, which shrinks and should become solid. The diminished circulation in the limb below demands treatment by warm wrapping, elevation, artificial maintenance of heat, and prolonged, frequently-repeated upward rubbing, in order to aid the venous circulation. Following ligature there may be:—

a. Recurrence of pulsation. In the course of a few days after successful ligature pulsation may recur in the aneurysm, but as a rule it disappears in a few days more, of its own accord, or with slight aid. Bandaging the elevated limb and compression of the aneurysmal swelling may first be tried. Then digital pressure upon, or ligature of, those collateral branches which have influence upon its pulsation; or ligature of the artery distal to the sac may be resorted to. If a fair trial of these means fail, the Matas operation is indicated.

b. Gangrene. If the limb continue to be shrunken, pallid, and cold, definite gangrene is to be expected before the end of the first week. If the gangrene be dry, the whole extremity may, after thorough cleansing, be wrapped in antiseptic wadding, and the appearance of a line of demarcation awaited. If the gangrene be septic and moist, the sooner the limb can be amputated above the aneurysm the better.

c. Suppuration in the sac. The ordinary evidences of formation of pus in the sac indicate the same treatment as for suppuration elsewhere. It should be freely opened, its contents evacuated, its interior packed. If inflammation has not extended from the sac into the surrounding tissues, so as to make excision impossible, this will

be the best treatment. Amputation will offer the best chance if secondary hæmorrhage after suppuration should occur.

2. *Distal Ligature.*—The only condition in which this has been employed with encouraging success has been in aneurysms of the lower part of the common carotid artery.

Recent advances in blood-vessel surgery justify the expectation that, in the near future, cases in which the blood-vessels on either side of the aneurysm are fairly healthy will be treated by excision of the sac and restoration of the vessel by the transplantation of a graft.

Surgical aneurysm is the result of syphilitic disease of the blood-vessels almost as frequently as medical aneurysm. If there is a history, or other evidence, of this disease, including a positive Wassermann reaction, treatment of the aneurysm should be followed by an antisyphilitic course.

Aneurysmal Varix and Arterio-venous Aneurysm.

The dangers and difficulties of operation in such cases where large vessels are involved and where the circulation is difficult to control, must be fully realized; yet the dangers and discomforts resulting from the lesions may be so serious that the risks of operation have to be faced. In cases of aneurysmal varix, palliation may be obtained by the use of an elastic bandage, and occasionally a pad over the orifice of communication can be so effectually applied as to remove all the distressing symptoms. When, however, a tumour is present, operation is a necessity, for the aneurysmal swelling is progressive and will eventually rupture. The operation usually implies separating the artery and vein, and tying both vessels above and below the opening. After separation it may be possible to close the opening in each by carefully applied sutures, and this is the best surgery.

Aneurysms of the Upper Extremity.

Axillary Aneurysms.—On account of their rapid growth, the serious pressure symptoms they occasion, and their liability to rupture, active treatment is essential. There are four methods of attack, from which a choice must be made: (1) *Pressure*; (2) *Ligature of the Artery above the Aneurysm*; (3) *Excision of the Sac*; (4) *Matas' Operation.*

1. *Pressure* is so painful as to necessitate the use of an anæsthetic, and relays of assistants are required in order to hasten the result. The method of application is as follows: The spot above the clavicle on the third part of the subclavian artery, pressure on which completely arrests the circulation in the aneurysm and in the vessels below, is to be noted and marked. Then an elastic bandage is applied firmly to the limb from below up to the axilla, but not over the

aneurysm. By pressure on the third part of the subclavian the circulation in the aneurysm must be totally arrested, and the elastic-bandage pressure should be maintained for one hour, after which digital pressure should be continued for three hours more, and then gradually relaxed.

In fat or unusually muscular subjects it may be impossible to control the circulation with the skin undivided. It would be possible and proper in such a case to make the pressure through a wound over the vessel. It is almost superfluous to add that such a wound could be safely made only under perfect surgical conditions, and that those who compress the vessel would necessarily wear sterile indiarubber gloves.

2. *Ligature of the Artery above the Aneurysm.*—If the aneurysm involves the lower part of the artery it will be possible to ligature the artery above it, but as a rule, even in these circumstances, the operation of choice will be by ligature of the third part of the subclavian, as the dangers and difficulties of the latter operation, when in the hands of a skilled surgeon, are now comparatively small, and the after-results fairly good.

3. *Excision of the Sac.*—This is still regarded as a last resource by the majority of surgeons, but evidence is accumulating in its favour. It should be the method of choice in dealing with large, rapidly increasing aneurysms which are causing œdema and paralysis of the limb.

4. *Matas' Operation.*—If the circulation can be satisfactorily controlled, Matas' operation would be better than excision of the sac.

Brachial Aneurysm.—Compression here is easily performed, and should be fairly tried. For cases at the bend of the elbow, flexion is the method of choice. For those due to traumatism and embolism, excision is the only satisfactory treatment. It is certain that, unless prolongation of the operation for any special reason is undesirable, excision of the sac should be followed by blood-vessel grafting.

Aneurysm of a Palmar Vessel.—Compression of the aneurysm and of its arteries of supply, along with elevation of the limb, may first be tried. A splint is to be applied over the extensor surface of the hand and forearm, and pressure pads adjusted over the radial and ulnar arteries and over the tumour. The hand and arm are then slung at a right angle. If this does not succeed, it will be necessary to ligature the radial and ulnar and to compress with pads the interosseous and median arteries, and to elevate the limb. Excision in the palm is difficult, and may occasion irreparable damage to the usefulness of the hand.

Aneurysms of the Lower Extremity.

In this region popliteal aneurysms are the most common. They outnumber those of the femoral artery in the proportion of four to one. Below the popliteal, aneurysms are rare.

Femoral Aneurysm.—Compression treatment by means of elastic bandaging may be tried before operation is resorted to. (*Vide* pp. 376, 377.)

If pressure treatment fails, then the Matas' operation, ligature of the artery above the aneurysm, or excision of the sac, must be resorted to.

Popliteal Aneurysm.—Pressure and flexion of the knee are methods of treatment frequently successful, and comparatively free from danger. They are therefore deserving of fair recognition. (*Vide* pp. 376, 377.) At least 50 per cent of popliteal aneurysms can be cured by pressure.

Ligature of the femoral artery at the apex of Scarpa's triangle is the easiest of the ligature operations for popliteal aneurysm, and it has yielded good results, about 80 per cent of cures having been effected by its means. It seems probable that ligature of the femoral artery in Hunter's canal, or of the popliteal above the aneurysm, might give results even better than these.

Excision of the sac is necessary if the aneurysm is not cured by one or other of the ligature operations above mentioned, or if, after cure, it is the cause of painful contraction symptoms. The Matas' operation or excision of the sac is, moreover, the only alternative to amputation when the sac has ruptured. Under suitable surgical conditions, the Matas' operation should be done for all popliteal aneurysms.

Gluteal Aneurysm.—It is necessary to remember that a gluteal aneurysm, owing to its progressive tendency, always demands active surgical treatment. The most successful method of attack as yet reported has been by the injection of a solution of perchloride of iron (20 per cent) into the sac. This does not seem to have been followed by serious consequences. The injection (50 minims) is introduced at several places, a few drops at each, whilst the sac is compressed laterally. Rest should be enforced for ten days afterwards.

Incision of the sac, arrest of hæmorrhage by finger pressure, and, after the necessary dissection, ligature of the vessel above and below the aneurysm is an operative procedure which has been successfully carried out. It would be safer to ligature the internal iliac artery, though even this may not succeed.

Abbe did a Matas obliterative operation with success after passing a ligature round the internal iliac artery to control temporarily the

circulation in the aneurysm. It is probable that this is the operation of choice, but the undertaking is a responsible one.

Aneurysm of the Leg and Foot.—These are encountered but rarely. The most satisfactory treatment is by excision of the sac.

Aneurysms of the Neck.

Aneurysm of the Common Carotid Artery.—When the aneurysm is at its most common site, i.e., at the bifurcation of the artery, the surgical methods of treatment available are: (1) *Digital Pressure*; (2) *Needling the Sac*; (3) *Ligature of the Artery below the Sac*; (4) *Excision of the Sac*; (5) *The Matas Operation.* Before one or other of the above operative procedures is selected, the medical measures described in connection with thoracic aneurysm should have been given a fair trial, since they have at least arrested the progress of the aneurysm for a time. Surgical interference should be resorted to only when threatening signs are present.

1. *Pressure.*—Digital pressure on the vessels below the aneurysm and against the soft parts covering the spine is the best form of surgical treatment, but can seldom be brought to a complete conclusion, nor indeed be tolerated in most cases for any protracted period of time. Daily repetitions are necessary, and should be continued for as long as they can be borne. The development of cerebral symptoms, such as loss of consciousness, convulsions, or paralysis, may necessitate abandonment of the procedure. The pressure method of treatment is most likely to be successful with young subjects, and in cases of traumatic aneurysm.

2. *Needling of the Sac* may be used either in addition to the above method (pressure) or as an independent procedure.

3. *Ligature of the Artery below the Sac* has been associated with a high rate of mortality, chiefly in consequence of disturbances in the cerebral circulation, and apart from this has in some cases not cured the aneurysm. It is therefore at the present time an operation not in favour.

4. *Excision of the Sac* is probably less dangerous than ligature of the artery below, and if it can be accomplished the cure of the aneurysm is certain. On these grounds recent surgical opinion is in favour of the operation. It is chiefly indicated in cases of traumatic aneurysm of young people. Before either proximal ligature or excision is undertaken, the circulation in the other carotid artery should be tested. A skilled surgeon could now restore the vessels with a graft after excision of the aneurysm.

5. *The Matas Operation*, i.e., obliteration of the sac by suture, leaving sufficient to transmit blood, may here find a field for usefulness, and, in favourable cases, exclude other forms of treatment.

Aneurysms of the External and Internal Carotid Arteries.—These are treated by ligature of the vessel below the aneurysm, or, if this be not possible, by ligature of the common carotid.

Aneurysm of the Innominate Artery.—Needling and electrolysis have both been used with success. The operation of choice, provided that both common carotids are pervious, is that of simultaneous ligature of the right common carotid and subclavian arteries. It has been followed by good results.

Aneurysm of the Subclavian Artery.

Of the 1st part.—The treatment is the same as that for innominate aneurysm.

Of the 2nd part.—After failure of medical treatment and of 'needling,' which should have a fair trial, simultaneous ligature of the common carotid and of the subclavian arteries beyond the aneurysm is indicated.

Of the 3rd part.—Direct compression and proximal compression have both been tried, and with some success. Proximal ligature of the first, second, or third part of the subclavian artery may be done; or ligature of the innominate and common carotid arteries; or amputation at the shoulder with high ligature of the artery. All of these operations have failed to cure the aneurysm, and the mortality has been appalling. Excision of the sac has given the best results. In a recent case of leaking subclavian aneurysm, I effected a cure by ligature of the innominate and common carotid arteries, surrounding the ligatured portions with a graft of fascia lata.

Aneurysm of the Vertebral Artery.—In the only reported case, the aneurysm occurred at the lower part of the artery, and the vertebral was tied close to the subclavian and divided. A cure resulted.

Arterio-venous Aneurysm of the Carotid and Jugular Vessels.—Digital compression of the carotid artery below the sac should be fairly tried first. Operative treatment is not to be lightly undertaken, both on account of its inherent danger and in view of the known natural history of these cases. In many of them the swelling remains stationary, and the disturbed cerebral and cephalic circulation ceases to cause the trouble it had originally produced. Severe pressure symptoms and rapid growth are the indications for operation. The artery and vein should be separated and the openings in each closed by suture, or the vessels are to be ligatured above and below the openings and the sac incised and emptied.

Subclavian Arterio-venous Aneurysm.—Treatment is the same as for the previous variety.

Abdominal Aneurysms.

It is to be remembered that in dealing with these cases medical

treatment ought first to be given a fair trial. In this connection it is of interest that two cases of cure after the administration of calcium chloride have been recorded.

Pressure on the vessel above the aneurysm may be applied by means of an abdominal tourniquet, and when the aneurysm is not too highly situated may prove successful. The pressure must not be applied for too long a stretch, but is to be repeated from time to time, a due watch being kept meanwhile over the patient's general condition.

Introduction of Wire into the Aneurysm has been the only other method of treatment attended by any success.

Steady diminution of the size of the entering artery by gradually tightened bands or ligatures of metal or of silk has been recently employed with some success; but in favourable cases surgeons, in the near future, will excise the aneurysm and restore the vessel by a graft.

Aneurysms of the Visceral Branches of the Aorta, with the exception of the renal artery, have not yet been brought into the domain of practical surgery.

Aneurysms of the Renal Artery have been successfully extirpated along with the kidney on more than one occasion.

The other vessels, in view of recent improvements in blood-vessel surgery, such as the Matas method of treatment for aneurysm, end-to-end or lateral anastomosis of vessels, and transplantation of vessel grafts, cannot fail to come under surgical treatment in the near future.

Inguinal Aneurysms.—The term is applied to aneurysms of the iliac arteries, though the femoral may be involved. Digital pressure on the artery above may be tried first, and its action may be assisted by compression of the tumour. If pressure treatment fails after a fair but short trial, the Matas operation should be done, or the artery should be *ligatured* above the aneurysm. For ruptured aneurysm, and after failure of the above methods, the Matas operation or excision of the sac is called for.

PHLEBITIS.

(*Index of Treatment*, 7th Edition, 1915.)

Treatment depends upon the cause and extent of the phlebitis. An inflammation when due to causes not actively septic, and localized in a small vein, runs a favourable course if the part be protected from injury and movement. The single risk is that of embolism through the detachment of clot from the inflamed and thrombosed vein, and

this is to be minimized by securing that the clot shall be left undisturbed till it has either been absorbed, or has formed strong attachments to the vessel wall. This takes ten days.

The most common example occurs in connection with varicose veins of the legs, and in such cases elevation of the limb, rest in the horizontal position in splints for two weeks after the active mischief has ceased, and hot applications, are suitable treatment.

Where deeper veins are involved—for instance, the common femoral—the cause is more serious, and the extent of the clotting less likely to be limited. Preventive treatment therefore occupies a position of first importance. In all cases likely to develop this complication—and it is specially common in patients who have lost much blood and have undergone some pelvic traumatism such as fractured pelvis, difficult parturition, or operation for pelvic disease, and still more so if septic infection has been superadded—the lower limbs should be rubbed upwards three or four times daily in order to assist the venous circulation, and this should be commenced not later than a week after confinement to bed. At the same time daily exercise of the legs should be practised, the movements being similar to those used to propel a bicycle These simple measures, which I have now advocated and employed for some years, rarely fail to prevent phlegmasia alba dolens, the classical name for phlebitis and thrombosis of the femoral vein.

The treatment of the developed condition is, to say the least, unsatisfactory. The pain may be relieved by elevation of the limb, complete rest of body and limb, and the use of hot fomentations containing opium or belladonna. Careful nursing and fever diet are necessary during the first two weeks. If all tenderness has then disappeared, and there are no signs of further extension of the inflammation and clotting, gentle massage may be commenced, with the object of reducing swelling and assisting the anastomotic circulation in the limb. At a later stage more vigorous massage is employed, and when the patient gets up, as he may be allowed to do in favourable cases after the sixth week, an elastic bandage aids in the reduction of that swelling of the limb which constitutes the most troublesome and rebellious of the inflammatory results.

In the most acutely septic cases, recognized always by their recurring rigors, the only treatment likely to be successful is arrest of the circulation through the infected vein by means of operation.

The most successful application of this method of treatment has been in septic phlebitis and thrombosis of the lateral sinus secondary to suppuration in the middle ear. In such cases operation has been the means of saving many lives.

A more recent application of operative methods for arrest of the

circulation in infected veins deserves more recognition than it has yet received.

As a consequence of uterine sepsis, generally puerperal, thrombophlebitis of the pelvic veins may occur. Recurring rigors in a predisposed woman are strong evidence, however good the general condition of the patient between the rigors may be, that this is the cause of her illness, that surgical measures alone are likely to be useful, and that operation to obliterate or excise the infected veins should be considered without delay.

A similar condition occurs in connection with rare cases of acute appendicitis. Thrombophlebitis of the appendicular veins follows the attack or the operation, and may steadily progress to infection of the liver through the portal circulation. The first evidence is a rigor; this is followed by repeated, usually daily, rigors, and the patient, though often at first in good condition, rarely escapes death. Excision of the ileocolic vessels and the bowel which they supply (six inches of ileum, cæcum, and ascending colon), followed by anastomosis between the ileum and transverse colon, is now so safe an operation, and offers in an early stage so good a chance of arresting the venous infection, that on the first available opportunity I intend to have the courage of my convictions and perform it.

Phlebitis of the facial veins occurs frequently from infections of the face, and thrombosis of the cerebral sinuses may follow spread of the sepsis. All superficial septic foci on the face should be isolated by a circular incision, and if this demonstrates thrombosis, the infected veins should be opened, the thrombus followed up and removed, and the resulting wound should be packed open with sterile or iodoform gauze.

VARICOCELE.

(*Index of Treatment*, 7th Edition, 1915.)

The treatment required for this condition may be either palliative or radical. Palliative treatment is sufficient for the great majority of cases, but radical measures are sometimes indicated when the local trouble is great, and are inevitable when 'Service requirements' call for their employment. When free to choose, the surgeon will operate but seldom. The slighter cases do not require such treatment, and the graver ones often suggest the co-existence of an underlying psychological abnormality which no operation can reach or benefit. There are, moreover, some special risks connected with the operation itself. The local trouble—entailing pain and distress as it does—

may indeed act as a natural check to unwholesome outbreaks of excessive emotional excitement, and so even subserve on the whole the advantage of the patient. It is a fact that the melancholia which is sometimes associated with these cases may be increased by an operation which is quite successful in its local results. On the other hand, when the local trouble is serious, but at the same time unaccompanied by the graver symptoms of neurosis, excellent results may be expected. Even then, however, the operation is not one to be undertaken lightly.

It has been stated by eminent authorities that atrophy of the testicle never follows varicocele. It seldom does, though abnormal softness and flabbiness of the organ are not infrequently noticeable; but that atrophy may occur I am certain, for I have watched its development. It must be admitted, however, that atrophy of the testicle following varicocele occurs most commonly as a direct result of hopeless anatomical injury inflicted during operation, which has sometimes included not only destruction of the small veins of the areolar tissue surrounding the vas—on which the parts below the seat of operation depend for venous return after the main trunks have been ligatured—but even ligature of the spermatic artery itself. These risks are to be avoided by careful operation. The areolar tissue surrounding the veins which are to be tied and removed must not be wounded or injured, except in so far as is necessary to expose the veins for dissection. The dissection must then be made close and clean off the veins, conserving most carefully the tissue in which they lie embedded. On no account are the veins to be separated by any crude incision through the connective tissue uniting them with the other constituents of the cord. It is also to be remembered that even in careful and experienced hands the maintenance of an adequate venous return is not absolutely assured. The risks are slight if due care be exercised, but the minute veins of the connective tissue have been known to prove unequal to the task imposed on them.

For the majority of cases treatment is simple. We are to enjoin obedience to well-known laws of health. Regular exercise, attention to the state of the bowels, avoidance of sexual excess, and sometimes the desirability of marriage, should be specially recommended, and for local measures the use of a suspensory bandage and frequent cold bathing. The indications for operation are: (1) A large varicocele with pain on standing or after exercise, and increased by hot weather or sexual excitement; (2) 'Service demands.' Many young men otherwise eligible are refused admission to the public services for a small varicocele. It is necessary for their admission that this should be removed, though there are no surgical indications for the operation.

The Operation.—The veins are to be carefully dissected from other structures of the cord through an inch-long transverse incision

over the external abdominal ring, and excised between ligatures, one above and the other below. The cord may be shortened at the same time by transfixing the stumps of the cut veins and tying their ends together. No drainage is required. The patient should be kept in bed or in a recumbent position until the wound has soundly healed and a strong cicatrix has formed. In from twelve to fourteen days he may get about with a suspensory bandage, but it will be from four to five weeks before the full beneficial effects of the operation will be experienced. Before undertaking the operation, any atrophy of the testicle present at the time should be noted.

VARICOSE VEINS.

(*Index of Treatment*, 7th Edition, 1915.)

Treatment as affecting the leg only will be considered. Varicocele and hæmorrhoids are separately dealt with elsewhere. Other varieties of varicose disorder are by comparison of minor surgical importance, and their treatment in the main is deducible from the general features of that applying to the leg. The treatment may be either palliative or radical.

In many cases no appreciable discomfort is experienced from even large varicose veins, and for these, beyond cold bathing and rubbing, nothing is needed.

In a large number of instances fatigue is felt after walking or prolonged standing, and there is a sense of fullness and heaviness in the limb. The indications will generally be to remove any hindrances to the return of venous blood from below, such as tight garters and corsets, fæcal accumulations in the sigmoid flexure, abdominal tumours, etc., and to forbid prolonged standing.

Local treatment by an efficient support is of the greatest importance. A well-fitting elastic stocking is most easily applied and most serviceable. These require, however, frequent renewal, as they soon become useless, and the yearly cost of their upkeep is considerable. An elastic bandage, or one possessed of elasticity, such as of flannel or crape, if carefully applied from the foot upwards, every morning before rising from bed, serves the same purpose as the elastic stocking, and without expense. Rubbing the limb, especially from below upwards, and cold water are valuable aids towards keeping the skin healthy and the veins free from engorgement. For the majority of patients I know of no exercise so suitable as cycling.

Cases for Operation.—In most instances the troublesome varicose changes occur in the internal saphenous vein and its tributaries. In

these cases—and in these only—operation gives very satisfactory results.

The Indications for Operation are: (1) Nutritional disturbances of the skin of the leg, e.g., eczema and ulcer; (2) Adhesion of the dilated veins to the thin, stretched, overlying skin, which makes rupture possible; (3) Swelling, pain, and weakness in the leg which have resisted other treatment; (4) In some instances, inflammation and thrombosis of the diseased veins. Thus, operation may be specially called for when thrombosis is gradually extending upwards towards the saphenous opening, and threatening to invade the deep trunks, or when portions of the thrombus have been detached, and have caused symptoms of embolism. In these inflammatory conditions the upper end of the vein should be ligatured at the commencement of the operation in order to obviate *immediate* risks of embolism.

The Operation.—Many operations are described, but only two require serious consideration. These are: (1) Excision of the upper part of the internal saphenous vein (Trendelenburg's operation); (2) Excision of the vein from the ankle to the saphenous opening. Our choice between these two operations can be settled by a test. The veins are to be emptied by elevation of the limb, the patient lying down. Then, if a finger be pressed over the upper part of the saphenous vein and the patient stands up, no rapid refilling of the veins may occur. If the finger pressure is relaxed the diseased vein may quickly distend, showing that its valves are incompetent, and suggesting that excision of the upper part of it (Trendelenburg's operation) may suffice, but it seldom does. If, in spite of finger pressure above, the diseased veins fill on the assumption of an erect posture, excision of the whole vein is indicated. The very long incision required for this has always, in my experience, healed without trouble, though it must be remembered that any operative interference with veins, apart from the risks of sepsis, which are avoidable, are attended by the danger of pulmonary embolism, from which several deaths have been recorded. The upper portion of the vein can be easily removed through a short transverse incision over it at the upper end, and a second or more below. After exposure of the vein above, it is divided, ligatured at its proximal end, and clamped below. It is again exposed by a short transverse incision about ten inches lower down, clamped below, and divided above the clamp. A long-eyed or acorn-pointed probe is then passed upwards into the open end of the vein till it reaches the upper exposed portion. A ligature round the acorn head of the probe and the vein, or a suture through the vein and the eye of the probe, fixes the two firmly together. By traction on the probe the vein is drawn out and removed, more readily by the eyed probe, which withdraws the vein

turned inside out instead of crumpled up as with the other probe. This process may be repeated lower down till the whole vein has been extirpated; but it is not as a rule satisfactory for the leg portion, where adhesions to the skin and surrounding parts are usually present, and excision there is a better method.

The incision should as far as possible avoid the most unhealthy portions of skin. Though it must cross the bends of a sinuous dilated vein occasionally, it should on the whole take a marginal course, so as to run clear of the thin, stretched skin by which the vein is covered. When skin and vein are adherent, the skin must be excised with the vein. In addition to excision of the vein trunk, any specially dilated portions and saccules should be excised through small separate incisions.

Hæmorrhage from varicose leg veins is of infrequent occurrence, but I recall being called to see a middle-aged woman, and finding her held up on a chair by friends, her leg in a pail of mixed blood and cold water; brandy was there in abundance, and she was dead. The bleeding was due to spontaneous rupture of a sacculus of the internal saphenous vein, as it usually is. The horizontal posture, with removal of constriction above, elevation of the limb, and a pad with a moderate compression bandage, at once stops the bleeding in these cases. As soon as the skin wound has healed the diseased vein should be excised.

WOUNDS OF ARTERIES AND VEINS.

(*Index of Treatment*, 7th Edition, 1915.)

A wound in the blood-vessels may be complete or incomplete, subcutaneous or open, and involve arteries, veins, or capillaries.

If the division of an artery is complete and due to a sharp instrument, hæmorrhage is immediate and more or less serious, depending upon the size of the vessel injured and the freedom and rapidity with which blood escapes. The lesser vessels will spontaneously cease to bleed from contraction and retraction of their walls, clot formation, and weakening power of the heart; the larger cause such sudden and serious hæmorrhage that life can only be saved by the promptest help.

If complete division of an artery is produced by a blunt force, the outer elastic coat is likely to be drawn out beyond the intima and media, and the largest may be at least temporarily closed by torsion of this.

If the wound in an artery is incomplete, it may become blocked up by extravasated blood, and, if small, heal; if larger, a pulsating

hæmatoma, traumatic aneurysm, arteriovenous aneurysm, or aneurysmal varix may form later. A traumatic aneurysm not infrequently follows subcutaneous injury.

The most frequent subcutaneous injuries occur in the visceral areas to the middle meningeal, mesenteric, splenic, and hepatic vessels. In the extremities they often occur as a complication of fracture and dislocation, and a diagnosis may be made by noting the presence or absence of pulsation in the vessels below the line of injury.

If a rapidly enlarging hæmatoma forms after such an injury, an operation must be done and the bleeding vessels found and secured. In the skull, signs of compression, commencing a short time after injury, are the chief indications for operation; and, in the abdomen, signs of free fluid, and the well-known indications of hæmorrhage everywhere—viz., increasing pallor, especially to be noted in the lips, increasing rapidity and weakening of the pulse, anxiety and restlessness, sighing respiration, cold forehead, a clammy sweat, and inability to see clearly. In any case the proper treatment is to expose without delay the bleeding vessel in order to stop the escape of blood from it.

In the treatment of urgent open surgical hæmorrhage, the most important thing to remember is that *any bleeding point which can be reached by the finger is under its control.* A slight degree of finger pressure well applied will temporarily arrest any bleeding.

The next, scarcely of less importance, is that wounds which have not been fingered or probed rarely fail to heal without infection, but those into which fingers or probes have been introduced rarely escape it. The only excuse, then, for the introduction of a finger is urgency, and when this has been met, the next indication is to disinfect the wound and its surroundings as soon as possible. For this purpose weak tincture of iodine painted around, and run into, the wound is a valuable aid. In the extremities, digital pressure on the main artery, or the use of a tourniquet, make interference with a wound before proper preparation unjustifiable.

An elevated posture, cold, heat, exposure to the air, the pressure of a pad, the actual cautery, and chemical agents, such as turpentine, perchloride of iron, suprarenal extract, and others, may suffice for the arrest of diffuse, but not profuse, hæmorrhagic oozing. Any serious hæmorrhage requires more direct and surgical measures.

The first rule should be to *see* the bleeding point. Free exposure and a good light are essential aids. The next is to ligature the divided vessels. These rules have few exceptions, which will be noted later.

Secondary Hæmorrhage.—A serious form of bleeding due to wound sepsis, and known as secondary hæmorrhage, less common than formerly, but still of too frequent occurrence, requires prompt and

energetic treatment if the patient is not to be allowed to die as a result of it. Usually from the tenth to the twelfth day sudden arterial hæmorrhage occurs, without previous warning, from the septic wound. A suitably-placed pad and slight pressure easily arrests it for the time, but the tendency to recurrence is so great that reliance should not be placed upon this. The rule should be to open the wound freely without waiting for another hæmorrhage, to disinfect it as well as possible, to explore the bleeding points, and by one or other means secure the bleeding artery by ligatures in more healthy portions above and below, leaving the wound freely open and lightly packed with an antiseptic dressing. When all of this has been accomplished, it is still necessary to ensure constant skilled attendance for fourteen days afterwards, so that possible recurrence may be promptly dealt with.

Venous Hæmorrhage.—This is recognized by the darker colour of the blood and the continuous discharge of it, as compared with the bright colour of arterial blood and its escape in jets. It is more readily arrested by a pad and pressure, but, if profuse, requires the same treatment as arterial hæmorrhage, viz., exposure and ligature of the bleeding points.

Venous hæmorrhage at the root of the neck or in the axilla may be accompanied by entrance of air into the veins, and the sudden hiss that follows is so alarming that, when it has been heard, no time should be lost in finding and closing the opening. My own experience of it must have been singularly fortunate, because I have never seen the entrance of air do any harm. To find the opening, the wound is filled with a moist gauze mop, and, keeping steady pressure upon it, this should be gradually slipped off the distal part of the vein until the opening is exposed. To close this opening, if ligature presents any difficulty, leave a pair of hæmostatic forceps on the hole in the vein and projecting from the wound for forty-eight hours, as this is a safe and successful measure.

Exceptions to the General Rules given.—When large and important vessels are wounded, occluding ligature of them is likely to be followed by serious consequences to the parts which they supply. It is now possible to close wounds in the blood-vessels and restore their lumen, to excise parts damaged beyond repair and remake the vessel by end-to-end anastomosis, or to fill up a gap by transplantation of portions of other vessels not so important. The principles of these operations are simple. They are asepsis, free exposure of the wounded vessels, complete control of the opening without damage to the vessel-walls, removal of all blood and clots from its lumen (irrigation with warm normal saline) without damage to the intima, and closure of the wound in the vessel-wall by a continuous fine silk suture through all the coats, everting the intima. Fine needles, gentle work, and

sterile vaseline for the silk and needles are necessary for success, which in competent hands is now assured.

Bleeding from the scalp is arrested with difficulty by Nature's means, because the great aids to arrest, retraction and contraction of its blood-vessels, cannot occur owing to the density of, and their adhesion to, the tissues of the scalp. For the same reason a ligature is difficult to apply. If pad-pressure fails to stop the bleeding, it can always be effected by the skilful use of needles and thread, which will act at the same time as ligatures and sutures.

Bleeding from the palmar and plantar arches is usually an exception to the rule as to seeing the bleeding point. On account of the inelasticity of the parts, even a large incision may not permit of this, while an extensive incision is sure to inflict damage on the important structures underneath the palmar or plantar fascia. But the bleeding is likely to be serious, and is unlikely to stop until the bleeding point is effectually blocked. Taking the hand for example, the following steps should be taken :—

1. Apply a tourniquet to the upper arm.

2. Use every means to ensure the absence and prevention of sepsis by the use of cleansing, sterilization, and antiseptics.

3. Pack carefully, but thoroughly, into the bottom of the wound a small pad of sterile gauze, soaked in weak tincture of iodine. On this place a similar but somewhat larger pad, and on this a larger still, until a thick conical composite pad (graduated compress) projects upwards from the palm. Holding this in position, apply narrow rolls of lint along the course of the lower two-thirds of the radial and ulnar arteries, on the front of the forearm. (The course of the radial artery is indicated by a line drawn from the middle of the bend of the elbow to the base of the styloid process of the radius ; and of the lower two-thirds of the ulnar artery by a line drawn from the tip of the internal condyle of the humerus to the radial side of the pisiform bone).

4. Apply a padded splint to the back of the forearm, reaching from the elbow to the tips of the fingers, and bandage it on carefully but firmly from below upwards, leaving the finger tips exposed.

5. With the patient in bed, elevate the limb to a position at as nearly a right angle as convenient, and remove the tourniquet. A suitable method of securing elevation is by the application of a long strap of adhesive plaster, folded over the end to form a loop, and fixed over the splint and bandages to the back and front of the forearm. The loop can then be fastened to a hook in the ceiling, or to the horizontal pole of a French bedstead or other available apparatus.

The after-treatment consists in letting the arm down in twenty-four hours ; and taking the splint and padding off the forearm in forty-

eight hours, when the patient can be allowed to get up and use a sling. Unless there is pain, or rise in temperature, the dressing need not be disturbed for a week. It can then be soaked off in boracic lotion, and the wound dressed in an ordinary way.

Bleeding from the Tonsil.—This can be arrested by a finger pressed on the tonsil, assisted by outside counter-pressure applied just behind and below the angle of the jaw. The throat should then be examined in a good light, when some spouting vessel may be seen. If this can be secured by artery forceps, these may either be left on for some hours projecting from the mouth, or if it seems feasible, a ligature may be passed under them on a needle and tied.

These measures failing, a long pair of padded forceps, one blade over the tonsil and the other resting on the neck, with the handles tied sufficiently firmly to compress the part, may be left on for a few hours.

Where these measures fail, it is necessary to tie the external carotid artery between its lingual and superior thyroid branches.

Bleeding from an incised tonsillar abscess may be very serious, and is often difficult to stop. A small piece of disinfected sponge dipped in turpentine, packed into and left in the cavity, will occasionally arrest it when all ordinary means have failed.

Hæmatemesis and Melæna.—On one occasion I was asked to see a child two years of age, with hæmatemesis and melæna of one week's duration. It was nearly dead, had a waxy skin, was dropsical from anæmia, and fainted when its head was raised. There was no sign of anything wrong in its abdomen. On examination of the mouth, after depressing the tongue, I saw with the greatest ease and distinctness a little artery pumping at the bottom of a small crack far back on the dorsum of the tongue. With a thick knitting-needle and a cork a cautery was improvised which arrested the bleeding at once and permanently. The child slowly recovered.

Bleeding from the nose that has resisted the ordinary remedies, such as keeping the arms raised above the head, pinching the nose, and breathing through the mouth, etc., may be so serious as to demand active measures. At times, with a good illumination, retractors, and sponging, it is possible to see a bleeding vessel on the septum; when this has been blocked, the bleeding ceases. More commonly, it is not possible to find the source of the bleeding, and pressure, by some form of dressing, is necessary. For many years, plugging the posterior nares was regarded as the only resort in serious cases; but the discomforts of it were such as to be apt to make the most heroic rebellious; and it was not without danger, for septic inflammation of the middle ear was not infrequent. By careful plugging through the anterior nares it is possible to arrest any ordinary hæmorrhage

from the nose. Gauze (preferably iodoform-formalin-glycerin), cut in the form of a square of sufficient size, is pushed by forceps pressing on its centre, along the floor of the nose to the back of it. The edges of the gauze, at the nostril, are then opened up to display the projecting mouth of the pocket, and the pocket is steadily filled by strips of gauze: first, directly backwards, along the floor; next, upwards and backwards towards the floor of the orbit; and, finally, directly upwards. The hardness of this plug can be increased by pressure on the core and traction on the edges of the pocket. It is necessary, before leaving the patient, to be sure that blood is not escaping down the throat. Watch for the gulping efforts attending swallowing under such circumstances, and examine the back of the throat.

Bleeding after Tooth-extraction.—This is seldom serious except in hæmophilics. Stypties may first be tried, and the best of these is turpentine. To apply this, dry the socket as effectually as possible by pressing a sponge firmly over it, and continue the sponge pressure while a dossil of lint is being prepared and soaked in the styptic. Remove the sponge and quickly apply the lint, holding it in position till it becomes fixed by coagulated blood. If this fails, plug the socket from the bottom with a narrow strip of gauze, using a probe, and leave the projecting end to form a pad over the opening. Place a piece of cork over the pad, and fix the jaws together with a bandage sufficiently firmly to press on the cork. If the bleeding comes from an opening between two sound teeth, it can usually be arrested by fixing a piece of sponge firmly between them over the bleeding orifice.

Bleeding from the Preputial Artery.—Serious bleeding from this source has occasionally followed forcible or awkward coitus. It can usually be arrested at once by the application of a small dossil of absorbent wool pressed over the bleeding point and retained in position by drawing the prepuce forward over it. If this fails, the torn artery should be snipped across with scissors, and if the bleeding does not cease after the retraction and contraction of it which this allows, it must be secured in forceps and tied in the ordinary way.

Bleeding from the Urethra.—This is usually the result of injury, and ceases spontaneously on the assumption of a horizontal posture. If not, the source of the hæmorrhage, penile or deep urethral, must be ascertained by pressure tests. For the penile portion, a catheter should be introduced to the root of the penis, which should be firmly bandaged round it; for the deeper portion, after the catheter is in the bladder, a perineal pad and T-bandage supply the necessary pressure.

Bleeding from the Rectum.—If this is not arrested by rest in the horizontal posture and warmth to the surface, it is safest to administer

an anæsthetic, to fix the patient in a good light in the lithotomy posture, and dilate the sphincter, when the bleeding point or surface can be seen and treated by ligature or cautery. If the arrest is not complete, a firm four-inch-long tube should be introduced and packed all round with iodoform gauze.

Bleeding from the Uterus.—Severe hæmorrhage is most frequently the result of a miscarriage, and demands emptying of the uterus for its arrest. The vagina should be packed with gauze wrung out of weak tincture of iodine. The patient should then be placed in the lithotomy position, and in a good light. The next step is to cleanse and shave the external genitals, and put on clean indiarubber gloves. The cervix is then exposed by a Sim's speculum and the source of bleeding discovered. (Bimanual pelvic examination will next be made when a cause for the hæmorrhage is likely to be discovered.) If the os is dilated or dilatable, a finger can then be swept round the interior of the uterus, and can remove its contents, if there are any, or be followed by packing with gauze wrung out of weak tincture of iodine if there is nothing to come away. By introducing an antiseptic sponge tent into the undilated cervix the most serious hæmorrhage can always be temporarily arrested.

Bleeding from an Intercostal Artery.—A stab or an operation for empyema may divide an intercostal artery. Bleeding from this can be arrested by a plug. A piece of gauze, four layers thick and one foot square, soaked in tincture of iodine, should be laid over the wound so that its centre corresponds to the opening in the chest. The gauze is then pushed into the chest for about an inch, and the pouch so formed is packed with a strip till it forms a ball inside. By pushing on the packing and pulling on the gauze, sufficient pressure is produced on the intercostal artery against the rib to stop bleeding from it.

Bleeding from a Divided or Broken Bone is best treated by cutting off a small piece of muscle and pressing it over the bleeding surface.

Bleeding from an Extremity.—If any vessel is seen spouting, secure it at once in forceps. If the wound is large and deep and bleeding, arrest hæmorrhage by pressing upon the main artery above and get a tourniquet. None is better than the ambulance man's substitute, viz., a strong handkerchief folded narrow, tied loosely round the limb, and tightened up by twisting with a walking-stick or poker introduced between the limb and the handkerchief. Pack the wound gently with gauze wrung out of weak tincture of iodine, and cleanse the skin all round with a swab wrung out of the same. With the wound in a good light, sponge blood and clots away, if necessary enlarging the wound to see to the bottom of it. The open mouths of divided vessels may now be seen, caught, and ligatured. If the bleeding has been from a good-sized vessel, the distal as well as the

proximal end should be sought for and tied. If no open mouth is seen, having sponged the wound dry and clean, make pressure circularly on the limb from above downwards, when a drop of blood squeezed out may point to the orifice of a divided vessel.

If no result follows, untwist the tourniquet gently. If there is then no bleeding, apply a pad to the wound and bandage the limb, leaving the slack tourniquet in position, with directions how to use it if bleeding should recur.

If a large vessel has been wounded, bleeding from it will be evident when the tourniquet is loosened, and it is probable that only a hole has been made in it, otherwise its mouth would have been exposed by the previous proceedings.

It is now necessary to expose the vessel fully by dissection, and to treat the opening in it by suture, or to tie above and below the opening with ligatures passed by the help of an aneurysm needle. A good substitute for this may be found in a director and probe. The director is passed under the vessel and the probe guided under it by the groove.

NOTES OF AN AMERICAN TRIP.

(*University of Durham College of Medicine Gazette*, March, 1915.)

Mr. Hamilton Drummond, Mr. D'Oyly Grange and I visited America and saw as much as we could in July and August last. Our ship left Liverpool on a Saturday afternoon at the end of June. By the kindness of Professor Thelwall Thomas and Mr. Robert Kelly we occupied the morning of that day in watching their operations in the Royal Infirmary.

We saw Professor Thomas perform a gastro-enterostomy, remove a stone from the pelvis of a kidney, and excise a malignant tumour of the face. Mr. Kelly did a radical excision of the breast on a fat, elderly woman. The operations were done in two adjoining theatres, and it was clear that by this means, time and trouble and danger from imperfect preparation were saved.

The operations were most skilfully done, but what I would particularly wish to say is that the methods we saw there, in attempting to secure asepsis, were as complete in every detail as anything we saw in America, and that is saying a great deal.

We had reserved a cabin on the ship for the three of us, and soon settled down comfortably in it. The weather was so cold during the whole trip, that it was necessary to wear overcoats on deck, where most of our time was spent, much of it in playing deck billiards. On the morning of our departure there was sufficient swell to make getting

up and dressing a slow and difficult process, and none of us felt that breakfast was a meal to gloat over. On the whole, though the passage was not, from the nautical point of view, a good one—there were either dense fogs and a smooth sea, or strong winds and a rolling one—we enjoyed the complete change only obtainable on a sea voyage. As we approached the Gulf of St. Lawrence we passed through a field of icebergs in a dense fog. I will not attempt to describe either, because it has been much better done by others, but no one who has not been there can realize the beauty of the one or the discomfort of the other. One night, when there was a certain amount of danger, we had an interesting medical experience. We were, as was known to every one, passing over the neighbourhood of the wreck of the "Empress of Ireland," but I do not think the knowledge had as yet disturbed any. After dinner a concert was arranged, and one of the performers was a theatrical. His recitation, a tragical poem, was given with such effect, that many of the ladies could not be persuaded to go to bed, and paced the deck all night. They recovered next day.

We landed at Quebec on a Sunday morning, and found no further use for our overcoats, but great satisfaction in iced drinks, which no one can properly appreciate until heat has fairly driven all the spare moisture that is in, out of his body. The quaint and beautifully situated old city, with its historic scenes and inhabitants, so French that in many shops nothing but French is spoken, could not fail to interest the most inappreciative, and we were not that. We had been advised by a knowing traveller that we had first better cross the river, take our luggage to an hotel there, and engage sleeping berths on the train for the next day, so as to save time and trouble. The "Hotel" was a shock when we saw the outside of it, which was that of a third-class public-house, but after some discussion we resolved to have a look inside. It was an agreeable surprise, because the bedrooms were very good, and there was an excellent bathroom. A notice in that, to the effect that if it was not cleaned out after being used, an extra charge would be made, led to some argument as to who should go last and do the cleaning. The choice fell on Mr. Drummond, and Mr. Grange and I thought we had scored. We afterwards learned that no cleaning had been done, for the reason that as there were three of us we could, if necessary, resist such an imposition. Having settled there, we adjourned to a palatial hotel on the Dufferin Terrace in Quebec for dinner, and to spend the evening on the Terrace, where the whole of the City turned out to hear the music and to promenade. The Terrace was an immense wooden structure fixed into the side of the rocky hill on which Quebec stands, and we commented on the awful possibilities of a fire there with so many cigars about. Four days later it was entirely destroyed by fire caused by

a cigar end! If our education to sleep through anything on the way over had not stood us in good stead, we could not have had any sleep in the hotel, because it was in the station, and long trains were passing through all night. Even that education did not suffice for the next night, when we travelled in the noisiest, roughest train I have ever been in, to St. John, New Brunswick, where I had undertaken to give an address in surgery to the Canadian Medical Association, on July 8. In our small country we scarcely know what railway journeys are. Some of the members of the Medical Association had to spend three days and three nights in one train to get to their destination, and seemed to think nothing of it. The meeting, under the auspices of that kindest and most hospitable President (Dr. Murray MacLaren), was well attended, and the members were so enthusiastic, that the morning, afternoon, and evening of all days, except one, were fully occupied by papers, discussions, demonstrations, and addresses. The picnic element, so prominent a feature of our own Association meetings, was represented by one great event, a Clam Bake, on the afternoon of the last day. The whole Association adjourned to the seashore to see the clams (large shell-fish) baked in an immense heap of stones, heated by burning logs and seaweed. The clams when cooked were taken up to tents and distributed as the first course of a generous meal, to patrons—who appreciated them as a luxury beyond compare. None of our party was sufficiently educated to do them that justice which our generous hosts desired, but we satisfied them and ourselves to the full with the rest of the meal.

Dr. Harvey Cushing and Dr. Crile read papers at the meeting, and we arranged with them to visit their clinics on the following week.

The experience of our railway journey decided us on going to Boston by boat. This was really a floating hotel, with all the comforts and luxuries attached to one of the first class, and the trip was very pleasant. We had told Dr. Cushing of our intention, and he asked us to wire him the time of our arrival in Boston. The consequence of doing so was that immediately on the arrival of our boat at the quay we were accosted by a superior-looking gentleman in uniform, who enquired as to our identity. He then told us that he was Dr. Cushing's chauffeur, that he had brought the motor to take us to the club, and as soon as we had deposited our luggage there he would take us to the hospital. On arriving at the Harvard Club, a palatial mansion outside and in, we found that rooms had been engaged for us. In America 'the Club' is a much greater institution than with us, and has a further reaching influence. Its members have many privileges beyond the mere hospitality of its walls. Business transactions of every sort appear to be done through it, to the great advantage of its clients. Even a taxicab costs 25 per cent less when

ordered through its offices. It appears as if every man in America had a town and a country club.

After settling at the Club we drove to the Peter Bent Brigham Hospital, and found Dr. Cushing prepared to take us round and show the cases he was going to operate upon next day. He is Professor of Surgery at Harvard University, and the Medical College is close to the Hospital. His whole time is devoted to hospital and research work in the University, and he has consulting rooms and private wards in the Hospital for his private patients. The whole of the surgical work is done under his supervision by twelve assistants appointed by himself. Each assistant is expected to do some special research work, and his future advance depends upon the value of this. The consequences of such co-ordination are that this clinic is known throughout the world for the value of its output, and is one of the most interesting and instructive in America. The cases we saw in the wards were evidence in favour of Dr. Cushing's present bias towards diseases of the brain and spinal cord, in the surgery of which he has made invaluable advances.

We saw with what care and attention to every detail a diagnosis was arrived at in each case before operation, and it was not the least instructive part of our visit. One patient had typical Brown-Séquard paralysis. Her right leg was almost completely paralyzed as regards motion, and the left was nearly completely anæsthetic. The diagnosis made was tumour involving the cord on one side opposite the sixth dorsal segment. Next day this diagnosis was verified and the tumour was successfully removed.

Another case of great interest to us was that of a boy, age 8, who looked and acted as a youth of 18. His skeleton, as shown by the *x* rays, was that of a man of 18, his voice and hair and genital development offered the same indications. The diagnosis was that a tumour was pressing on and causing diminution of the secretion of his pineal gland. Dr. Cushing told us that this gland atrophied at puberty, that destructive disease of it caused the precocious sexual signs observable in this boy, and that experimental removal of it in young animals resulted in precocious sexual development. All I remembered concerning it was a cherry-stone like organ in relation to the superior quadrigeminal bodies, and that I had been told it was now an obsolete structure, the remnants of an eye, and still was an eye in one of the lizards. We have been slow to learn the lesson that things are not obsolete or functionless because we do not know yet what they are or why they are there, and such a belief has led surgeons into making serious mistakes. Largely because of this, careful study is now being made of these structures and their function, and it has been proved that the thyroid, the thymus, the parathyroids, the pancreas, the

suprarenals, the pineal gland, the testicles, the ovaries, and perhaps each structure in the body supplies to it an internal secretion necessary to the well-being of the whole. The difficulties of experimental and clinical observation are so great that progress must be slow, and definite knowledge difficult of acquirement, yet it appears as if this knowledge was the key to the fundamental problems of health and life, and that both depend upon the maintenance of a proper balance in the activities of each of these organs, disturbance of one acting upon all the rest. Gross disease in many of them is indicated by clinical symptoms and signs which already are well understood, and we had the opportunity in this clinic of seeing cases illustrating the extraordinary disturbances produced by changes in the pituitary gland, both by its over-action (hyperpituitarism) and its under-action (hypopituitarism). We also saw how the headache and threatened loss of sight in acromegaly (hyperpituitarism) could be relieved and prevented by timely decompression of the pituitary fossa; and how the defective secretion in adiposo-genital dystrophy (hypopituitarism) could be replaced by artificial supplies of the gland. If physicians fail to take a zealous interest in this subject, surgeons are going to make a further encroachment on their preserves.

After a long and instructive visit in the hospital, Professor Cushing drove us out in his motor for afternoon tea to the Country Club. The drive in an open motor was delightful—one felt that we had earned it, and the day was piping hot, not so bad as we were going to get, because in New York and Chicago we melted in a temperature of 100° F. in the shade, but very hot to us. In America a car, the natives call it an automobile, is almost a necessity, and everyone seems to have one. When it is so hot the air must be made to circulate by machinery, and every evening after dinner an endless procession of motor-cars can be seen flying from the large cities into the Parks, where they stay so late that we were never able to see when they went home.

After a drive of about twenty miles through the magnificent outskirts of Boston, we arrived at the Country Club, and I must tell you something about this. The Club house is a building like the mansion house in a large country estate. The Club is decidedly exclusive, and has a limited membership, so that members can enjoy all the privileges, and many more, of our richest country gentlemen. In the house itself nothing has been left wanting to ensure complete satisfaction, so far as that is obtainable through luxurious comforts. Shooting, fishing, horse-racing, riding, golf, tennis, croquet, swimming, baths, archery, racquets, and croquet, are all provided by the estate, and ladies, who are more important in America than in any other country, are not debarred from the privileges of the Club.

After tea we returned to Boston and went to an old club, frequented by Oliver Wendell Holmes, for supper as Dr. Cushing's guests.

I mention this day particularly, as it was our first experience of American hospitality, and we felt that we had been spoiled for the rest of the trip. Everywhere else, however, we were entertained with the most generous kindness, and whatever else may be forgotten these experiences never will.

As an operator, Dr. Cushing is a most skilful manipulator, careful, gentle, and deliberate in all he does, and like all of the Baltimore school, reverencing every drop of blood. His anæsthetist keeps a record of blood-pressure and pulse during all operations, so that warning may be given at the commencement of shock. Two or three hours is no unusual time to spend over an operation, and the results are wonderful, which makes it certain that rapidity is not the essential some surgeons imagine it to be, for successful surgery. There is a trinity of the greatest importance in all operations: (1) Gentle manipulations; (2) Prevention of hæmorrhage; (3) Avoidance of bacterial infection of the wound. All were religiously observed in this clinic, and the operations we saw would be described by those who had not been there as surgical romances if we told of them.

From Boston we went to Cleveland and Lakeside Hospital. The surgical side of it is in charge of Professor George Crile. Of all the surgeons I have met he has the largest grip of the principles of surgery. He has tried to find an explanation of its chief problems from the anatomical, physiological, pathological, and clinical evidence, till he has good reasons for all of his beliefs. He is so enthusiastic and advanced that it is difficult to keep pace with him, but what explanations one can follow, always throw a light, bright and all its own, on surgery. Like Dr. Cushing, he spends all his time in hospital and laboratory, and is one of the busiest surgeons in America. If he can be said to have a speciality it is goitre, as every morning we attended his clinic we saw from one to four cases operated upon. The work we saw him do was so instructive and fascinating that we spent a week in Cleveland.

The surgery of exophthalmic goitre specially interested me, as I appreciated acutely, from operations I had done, the special dangers associated with them. Dr. Crile talks of these cases expressively as patients "with a small margin of safety." They are certainly killed by an amount of shock which would scarcely affect an ordinary mortal. Even the fear preceding an operation has a percentage influence on the mortality of it. The administration of an anæsthetic in the ordinary way is specially dangerous to them, both at the time of the operation and later, and according to Dr. Crile, this is due to the development of acidosis. He gets rid of the danger of fear by setting

to work to gain the confidence of his patients to such an extent that they leave themselves wholly in his hands. They then undergo a preparatory course, during which a sufficient amount of nitrous oxide is given every morning to produce intoxication, and all the formulæ attendant upon an operation are carried out. On the day fixed for operation the same programme is adopted, but after the nitrous oxide and oxygen the patient is carried to the theatre. If the pulse and blood-pressure are satisfactory, an injection of morphia and atropine is given "to protect the brain cells." Then the whole skin area overlying the goitre is injected with novocain to arrest afferent impulses from the peripheral nerves. After the skin incision the deeper parts are injected, and every tissue before it is cut is permeated with the local anæsthetic. This combination of general and local anæsthesia is called anoci-association, and its object is to prevent any noxious stimuli from reaching the brain. The usual operation is excision of one lobe and the isthmus of the thyroid. It is all done with a sharp knife to avoid tearing and pulling, and it may be days before the patient realizes that the operation, which Dr. Crile describes as "stealing the gland," has been completed. All the patients we saw seemed very grateful for the theft that had been perpetrated. In spite of the fact that all the dissection was performed with a sharp knife, we saw an operation wound so dry that it was possible to demonstrate the lymphatic vessels leaving the gland and the parathyroids behind it. On this occasion we counted eighty clips in the neck. A great part of Dr. Crile's success may depend upon his dexterity, but no one who saw these patients in the wards, then in the operating theatre, and again in the wards, could fail to be impressed with their easy recovery, and to attribute some of this to the methods employed. It must also be remembered that each step is supported by experimental evidence, the result of prolonged and laborious laboratory work.

Dr. Lower, Dr. Crile's associate, has charge of the genito-urinary department, and is doing good work in his speciality. He and all of the assistants are enthusiasts in their belief in Dr. Crile's theories of shock and the methods of prevention, and as one of its most useful adjuncts is a mental influence of the nature of 'suggestion,' the importance of this coalition in the recovery of patients is of considerable importance. One case, a lady who had recovered from an operation for tuberculous peritonitis done some time ago, interested me very much, because Dr. Crile agreed with me in the belief that tuberculous patients were exceptionally easy to benefit by the stimulus of hope, and that the effect of operation depended chiefly upon this influence. He also said that his conclusions on tuberculin treatment were that the effects depended chiefly upon the individual who administered it.

One of our afternoons at Cleveland was spent with Dr. Lower, as his guests, on the Cleveland racecourse, at a typical American race meeting. The horses are trotters and pacers, and are driven, not ridden. The driving machine is a very low, light sort of gig. Betting figures largely in the sport, and it is carried on at regular business offices in the grand-stand enclosure. The one thing missing, and always in good evidence at English festivals, was drink and its effects. It is very rare, even in the largest towns in America, to see anyone drunk in the streets. Many of the best restaurants sell no alcoholic drinks. On Sundays, in hotels and clubs, no intoxicating liquors are sold, and many of the States have total prohibition. Theory is all against alcohol in the States, and practice seems to be tending in that direction too. After the race meeting we drove in Dr. Lower's motor to his country cottage, and found Mrs. Lower and friends at afternoon tea. The cottage is delightfully situated, and luxuriously equipped. It belonged to the club, of which he was a member, and was hired through its office.

From Cleveland we went to Baltimore, and brought away two outstanding remembrances. The first refers to a prostatectomy done by Dr. Young, of Johns Hopkins Hospital; the second to an appendicectomy by myself.

Dr. Young has a world-wide celebrity for his work on the prostate, but even this did not convey to us a proper appreciation of his work till we saw it. The operation of prostatectomy as usually performed is a crude, rough, unsurgical piece of work, because it involves tearing and crushing in a deep hole and in the dark. By Dr. Young's perineal method anatomical guides are essential, every manipulation can be gently carried out, and each step of the operation can be seen and followed. It did not surprise me after seeing his operation to learn that his results are the best published.

The interest of the appendicectomy does not concern the operation or the operator, but the patient. One morning Mr. Drummond, Mr. Grainge and I had gone to Johns Hopkins Hospital to see what we could, and were in the operating theatre between 10 and 11. Mr. Drummond did not look well, said he had some abdominal pain, and went back to the hotel. When we arrived there at one o'clock he was lying on the bed, looked ill and had been sick. His pain, all in the epigastrium, had been bad enough to make him roll about. His pulse and temperature were normal. For the first time he told us that he had had similar attacks before, which had passed off in a few hours. Palpation of his abdomen was easy, his swollen appendix could be felt, and pressure on it increased the pain in his epigastrium, which was his chief complaint. It was clear that he had appendicitis, that his pain was due to the efforts of the distended appendix to empty

itself, and that if it succeeded, as it had done before, he might be relieved as on previous occasions. If he had been at home there should have been no doubt or difficulty, because all of us would have agreed that the sooner his appendix was out, the better, seeing that it was a menace to his health and life. As things were it meant that, if an operation was done, his future in America would have to be spent in hospital, not as a visitor but a patient, and that outlook was sufficiently serious to decide postponement of a decision. By four o'clock the same afternoon he was decidedly worse. He now looked like a sick man, had vomited several times, his temperature had risen to 100° F., his pulse to 90, and his abdominal muscles in the right iliac fossa had become rigid, with marked underlying tenderness on palpation. At six o'clock I operated and removed the appendix, in Dr. Kelly's hospital, which by the great kindness of Drs. Burnham and Lewis, was placed at our disposal.

On opening his abdomen there was evidence of old attacks, as there were some firm, thick adhesions. The vermiform appendix was hot, swollen, red, and distended with septic contents. When it was opened the mucous membrane was found to be very much swollen, and at one part there was a small gangrenous patch. All the coats of it were thickened and there was marked fibrosis, a sign of old inflammation. There was no stricture, so that the obstruction had resulted from swelling of the mucous membrane of its cæcal end. The patient did so well that Mr. Grange and I felt justified in leaving him at the end of four days. During our stay there he was a model patient. We afterwards heard that on our departure he became his own medical adviser, and shocked the hospital doctors and nurses by getting up and going out at the end of a week. Fortunately everything he did failed to interfere with his recovery, and a fortnight after the operation he met me in New York, and we came home together.

In Philadelphia we visited the clinic of Dr. Deaver. He is a surgical genius possessed of such physical vigour that his ordinary operation lists are made up of from ten to twenty cases. He does nearly all his work unaided by assistants; mops, catches, and ties the blood-vessels; cuts his own ligatures, and only uses nurses as retractors. His work is done with such rapidity that his series of operations, many of them very serious, is completed in five hours. This means some 'orthopædic' though very skilful manipulations. We saw the largest and smallest incisions in his clinic; in difficult cases, especially pelvic ones, they were very free, in easy appendix cases a little over one inch. The advantage of so short an incision is obvious. It appeals to the public, which does not yet realize that it has to pay a percentage of penalty and mortality for such a mark of skill.

In New York we saw the celebrated orthopædic surgeon, Dr.

Royal Whitman, and spent a long morning in his clinic and wards. He used no splints, always plaster-of-Paris bandages, and he 'cured' fractures of the neck of the femur in patients, however old, by reduction and fixation in a position of extreme abduction.

In Chicago we saw Dr. Bevan, Dr. Lewis, and Dr. Ochsner.

Dr. Bevan is a great teacher, and has confirmed my belief that by far the most important duty of surgeons attached to a hospital school is to teach, that nothing should be allowed to interfere with this, and that everything should be done to aid it. His associate, Dr. Lewis, is a very careful and most skilful operator.

Dr. Ochsner, in many respects, reminded us of Dr. Deaver. He also is a surgical genius and his methods are unique. He operated with great skill and rapidity, doing every operation in surgery, and always has a large following. One thing in his clinic impressed me above all others—the care taken to make a complete diagnosis before operation.

Dr. Ochsner wrote down his own diagnosis and placed it in an envelope, which was not to be opened till after the operation. His assistants did the same. The envelopes were opened and read in the theatre; the diagnoses made were compared with what was found at the operation. It would be impossible to imagine any method more likely to stimulate research in surgical diagnosis, and this is *the* real test of surgical capacity.

My chief object in visiting America again was to go to the Mayo Clinic, but the war necessitated a start home the day I had intended to be in Rochester. I had been in America in 1891, and was able to compare then and now. The progress that has been made, although I expected much, astonished me. In the larger cities the appearance of rough unfinished work and things on the make has gone, and has been replaced by completed wonders in buildings and roads. We think the American *sometimes* talks big. If Grey Street, Newcastle-on-Tyne, was four times its present width, and five miles long, and if the buildings on either side of it reached the height of Grey's Monument, it would look something like Fifth Avenue in New York.

Would we in Newcastle, in such a case, not *often* talk very big indeed?

In surgery, as in everything else, enormous *progress* has been made, and I entertain no doubt that the most suitable postgraduate education for surgeons, as necessary for their progress as postgraduate study now is to all practitioners, is to be found in America. The American surgeons are cosmopolitan in their tastes; they have picked up and applied all that is best of the methods of every other country and have added to it that of their own.

Much of the detail of what we saw has been recorded in a conjoint

paper published in the *Medical Press and Circular* for February, 1915, so that anyone interested will find it there. Here I would like to deal generally with some matters of more ordinary interest, and comment on the whole surgical work.

Anæsthesia.—In all the clinics we visited, with the exception of Dr. Crile's, and it is, we were told, everywhere the same, general anæsthesia is brought about by the open ether method; chloroform was taboo, spinal anæsthesia we never saw, local anæsthesia was little in evidence. Ether by the intranasal and intratracheal method was in favour with Dr. Cushing, and for exceptional cases was used by Dr. Crile. There is a good reason for this choice: until recently there were no experts on anæsthetics in America, and open ether is, without question, the safest in unskilled hands.

The dangers common to all operations are hæmorrhage, shock, and sepsis, and it was of great interest to contrast the conduct of each surgeon in relation to these.

Hæmorrhage.—The older surgeon's aphorism, "Always go carefully when a patient has lost more than a pint of blood during the operation," would shock the newer generation unaccustomed to sights which made this recommendation tolerable. All surgeons now, and the Americans were no exception, have great respect for blood, and prevent its loss by skilful and free use of hæmostatic forceps. It was possible to recognize one of the Baltimore school by the attention he paid to this. For him, to prevent all blood loss was the important aim. Nothing could count against this. Operations must be done slowly to allow of it. For example, an excision of the breast with Halsted occupies from two to four hours.

Shock.—Except for the very definite precautions against it elaborated by Dr. Crile, we saw little special attention paid to it. Loss of blood is one of its most predisposing factors; this was everywhere prevented. Dr. Deaver minimises the risk of it by rapidity in operating; Dr. Ochsner by a minimum of anæsthetic. In the majority of clinics a preliminary injection of morphia and atropine diminished the tendency to it. Rectal or other injections of normal saline diminished its duration in all clinics.

Sepsis.—Everywhere the importance of preventing wound infection was recognized, and much more elaborate precautions were taken against it than is the rule, a rule fortunately with increasing exceptions, in this country. In no single clinic did we see any part of the patient or his clothing exposed, except that to be operated upon and the face. No surgeon or assistants or nurses or visitors wore ordinary clothing, all was specially cleansed. Operating theatres were much more sacred than with us. In all everything was dry sterilization with the exception of swabs, which were frequently

wrung out of normal saline. In many the skin was protected by clamping dry gauzes to the edges of the wound. In Dr. Cushing's the skin round the wound was protected by gauze wrung out of 1 in 1000 corrosive sublimate lotion. In Dr. Crile's the wound edges were brushed with tincture of iodine before they were closed. In Professor Thelwall Thomas's cases the suture needles were passed from the wound to the surface to avoid carrying in organisms from the skin. This is a great revolution since the introduction of antiseptics, as then the belief was that most wound infections came from the air. Now we have arrived at the opposite extreme, and most surgeons, nearly all, believe that contact infection is all that counts, and that aerial infection may be totally disregarded.

Is this right? I do not think so. How is this to be proved? By statistics, you say, of the results. Not at all. Surgery is still almost as much an art as a science, and results may depend upon either. But the science has been gradually killing the art in it, and the more quickly it does so the better. Why? Because until scientific methods are used as a guide (not this and that experience, which is always fallacious) real progress cannot be made. It would not be right to say that surgery now is not taking scientific guidance. That it has done so is the chief reason why such rapid progress has been made, but surgeons still have not sufficiently learned the lessons of bacteriology. Ask Professor Hutchens, or any other bacteriologist, if the air of our cities is sterile, or if by our present methods it is possible to disinfect completely the human skin. He cannot believe either, but surgeons still act on this belief, and consequently have not reached the ideal—a germ-free wound. Sterile air, sterile everything may be difficult of achievement, but that should be our aim. Meanwhile, until more perfect methods are reached, I think the dangers of infection from the patient's skin may be minimized by using two knives, (1) for the division of the skin (organisms are living in the sweat and sebaceous glands and their ducts), and (2) for deeper dissection; and from the air the chances of infection may be materially diminished by a lesson learned from nature. On a dry day, city air swarms with organisms; on a wet one few, if any, are to be found in it. If the floor of the operating theatre is damp, if wet towels are used round the wound, if the instruments are kept in solution, I believe that we can diminish the chances of aerial infection, which I do not doubt is a real danger, though contact infection is allowed by every one to be much the more usual and important.

Nothing now is of interest unless it involves some mention of the war, so this must not be omitted here. We heard of it first in New York, but only as a rumour. On reaching Chicago everything told us of it. The excitement was intense in both cities. Newspaper

offices were besieged at all times by crowds trying to read the latest telegrams. Newspaper boys were all over the place selling papers, and nobody would talk of anything else. So far as we could learn, England had the whole-hearted support of all America. We could get home on no English ship, and were delayed in getting an American one. The sea was as smooth as a duck pond the whole way across, and though we saw English warships, there was no incident worthy of record. The first days were so hot that even the sea-water had a temperature of 70° F. on the second day out from New York, and we were glad, if it might be for nothing else, to get back to the old country and be cooled down. There must be something in the atmosphere to keep us as a nation cool, because neither Mr. Drummond nor I could see in Liverpool anything to tell us of the great and serious events already in progress and impending.

A NOTE ON THE TREATMENT OF TRAUMATIC ANEURYSMS RESULTING FROM BULLET WOUNDS.

(*British Journal of Surgery*, No. 10, 1915.)

It is obvious to anyone who has seen many bullet wounds, that the tendency is for such missiles to push important structures like blood-vessels and nerves aside, and do no material damage. This could only occur if the vessels and nerves were mobile, but so far as I can find no importance has been attached to this point in current literature. Consequently, since it may be one of great practical importance, I am induced to record some experience bearing upon it.

Case.—T. G., age 28, was admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne, on July 4, 1913.

History.—Six months before his admission the patient was accidentally shot with a revolver at close range, and the bullet went through his thigh. The wound did not bleed much, and it was dressed in the accident room of the hospital. The thigh swelled very much, but this gradually disappeared. He next noticed a localized lump, gradually increasing in size. The chief trouble caused by it was a throbbing and weakness, with sufficient pain in the leg to make the latter useless for work.

On Admission.—The small entry and exit wounds of the bullet were marked by scars in front and behind. The entry wound was over the centre of Scarpa's triangle, the exit at the lower border of the middle of the gluteal fold. There was a swelling the size of a cocoa-nut extending from the wound of entry in Scarpa's triangle to the line of the adductor magnus behind. It had the characters—pulsation, thrill, and harsh murmur, all arrested by pressure on the femoral artery above—of an arterio-venous aneurysm. Pulsation and thrill were entirely arrested by pressure on the artery above, and the aneurysm could then be emptied by gentle pressure. The thrill

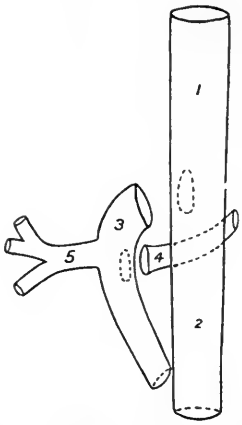


Fig. 80.—FEMORAL REGION. (1) Right common femoral artery. (2) Superficial femoral artery. (3) Deep femoral artery. (4) Internal circumflex artery. (5) External circumflex artery.

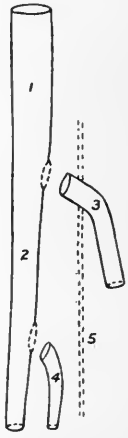


Fig. 81.—POPLITEAL REGION. (1) Popliteal artery from outer side. (2) Posterior tibial artery. (3) Anterior tibial artery. (4) Peroneal artery. (5) Interosseous membrane.

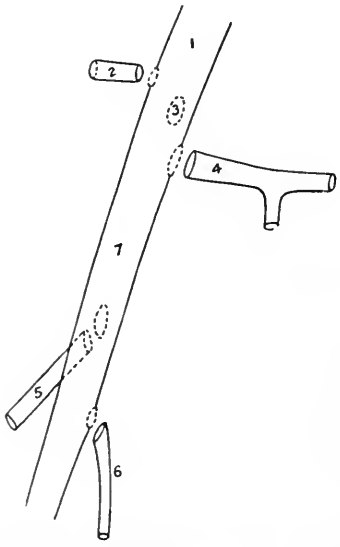


Fig. 82.—AXILLARY REGION. (1) Axillary artery. (2) Anterior circumflex artery (3) Posterior circumflex artery. (4) Subscapular artery. (5) Superior profunda artery. (6) Inferior profunda artery. (7) Brachial artery.

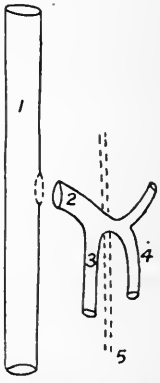


Fig. 83.—REGION OF ULNAR ARTERY. (1) Ulnar artery. (2) Common interosscous artery. (3) Anterior interosseous artery. (4) Posterior interosseous artery. (5) Interosseous membrane.

soon reappeared if pressure were relaxed on the artery above, but not if it were at the same time occluded below.

Operation (July 12, Mr. Morison).—The femoral artery was exposed by a long incision over it. The intention was to clamp the common femoral artery above and the superficial femoral below, to empty the aneurysm, expose the holes in the artery and vein, and close each by a suture. On exposing the vessels it was evident that this was impossible, as all of the tissues in the neighbourhood consisted of tough cicatricial tissue. After occluding the artery above and below with Crile's clamps, the sac of the aneurysm was opened; a terrifying rush of blood followed. With much difficulty two large arteries entering the sac from behind were caught, and the bleeding was arrested. There was a large hole almost encircling the femoral artery in the side of it next the vein. The artery was tied above and below this, and the wounded vein was treated in the same way. The sac was larger than it appeared at the examination to be, and extended into the adductor region, forming a cavity as large as the fœtal head. The inside of it was quite smooth and glistening, and looked as if it were lined by endothelium. A portion of this was removed for microscopic examination. The wound was entirely closed without drainage, and was completely healed when the dressing was removed on July 21.

Pathologist's Report on Specimen Excised.—"There is no trace of endothelial lining. The tissue shows no trace of remains of structure of vessel wall."

Subsequent Progress.—There never was any sign of circulatory difficulty in the leg, and when the patient left the hospital there was a strong pulse in both of his tibial arteries.

Such an experience was one not to be forgotten, but it did not convey any special message to me until I was helping Colonel Richardson with an arterio-venous aneurysm in the same situation in a soldier this year. Occlusion of the vessel above and below, opening of the aneurysm, subsequent furious bleeding most difficult to stop—and then I saw the explanation.

It is this: The escape of an artery from a bullet is due to its elasticity and mobility. At points where branches arise the artery is tethered by them, so that it becomes fixed and is pierced by the impact of the bullet, and the branches are either torn through or caught and divided.

The lesson is clear. Control of the artery above and below will not suffice. It is necessary to command the entire circulation of the limb before the aneurysm is opened in these cases.

Figs. 80, 81, 82, and 83, drawn for me by Major D'Oyly Grange, illustrate special regions in the extremities which are likely to cause trouble in operations on such aneurysms, and explain the way in which the injuries are caused.

1916

A CASE OF AMPUTATION OF THE THIGH.

(*The Clinical Journal*, May 24, 1916.)

A woman, age 44, was admitted to a private hospital, with moist gangrene of the foot and leg, on January 8, 1916.

History.—For many years she had been troubled by numbness and tingling in the feet and fingers. Her feet often felt as if they were "going to sleep," and in the morning, after washing, her "fingers went dead to the middle joint."

Six weeks before admission she developed pneumonia in the right lower lobe, and was delirious throughout her illness. Her temperature fell by lysis. Two weeks after the commencement of her illness, when she appeared to be improving, she was seized with a sudden sharp pain in the thigh and calf of her left leg. The limb first turned cold and white, and later purplish. A week later dark patches were noticed on the tips of the toes and the sole of the foot. At the end of another week the whole foot and lower third of the leg had become black, blebs had appeared on the skin, and the limb below the knee became swollen and livid in colour. A week before admission she had a sharp pain in her right upper arm, followed by numbness, tingling, and a feeling of cold in the forearm and hand. Her right radial pulse disappeared at this time. She had had incontinence of urine during her illness, and her back had become sore.

On Admission.—The patient looked very ill and emaciated. She was restless, could not sleep, and rambled in her talk. Her pulse in the left radial was 118, temperature 100° F. Systolic blood-pressure 105.

There was no radial pulse in the right arm, and pulsation could not be felt in any vessel below the bend of the elbow. The arm was cold, and the patient felt numbness and tingling in the hand and fingers.

Over the sacrum there was a black gangrenous patch of skin of the size of a five-shilling piece, surrounded by a circle of inflammatory redness.

There were moist râles over the lower half of the right lung, and shortly after admission she expectorated blood-stained sputum.

Her tongue was red and dry, otherwise, except for the condition of her left leg and the condition in her chest, arm, and back already

mentioned, nothing further was found. Her heart sounds, though weak, were normal.

The foot and left leg were in a condition of moist gangrene up to the junction of the lower and middle thirds. Above this a livid, red discoloration extended to the tubercle of the tibia in front, and to the junction of the upper with the middle third of the leg behind.

It was obvious from her condition that her only chance of recovery lay in amputation, through the thigh, and that if the operation was attended or followed by loss of blood or shock or sepsis, she would be killed by it. Every detail in connection with the operation consequently required special consideration.

The gangrenous leg was wrapped up and the skin of the thigh was washed and cleansed with corrosive sublimate lotion 1–1000, then covered by gauze wrung out of methylated spirit.

The Anæsthetic.—Half an hour before the operation $\frac{1}{4}$ grain of morphia and $\frac{1}{100}$ of a grain of atropine were injected hypodermically.

More than thirty years ago an Irish priest told me an interesting story. Father Mathew had made so successful a crusade against the use of alcohol that in many parts of Ireland none was obtainable. To compensate for this the peasants had taken to the inhalation of ether as an intoxicant, and the reverend father informed me that he had often seen members of his flock entirely unconscious from ether inhalation, and so unable to feel pain that they had fallen and hurt themselves badly without knowledge of it till they wakened. About the same time I read in one of the medical journals a paper by an author whose name I have forgotten, on the preliminary period of anæsthesia during the administration of anæsthetics. Notes of cases were offered where short operations had been performed by him on patients who were given a charged ether inhaler and told to breathe deeply into it, holding it over their faces as long as they could. As soon as the patient allowed the inhaler to fall off the operation commenced, and a short operation could be completed without any pain being felt. I began experimenting on these lines, and obtained results of sufficient interest to encourage a continuance of them. Single-handed I have since then done the smaller amputations, excised tumours, drawn teeth, reduced dislocations, tapped and injected hydroceles, removed ingrowing toe-nails, etc., without pain, in the first stage of ether anæsthesia. I have now interested and instructed my assistant, Dr. Eleanor Walkinshaw, in the method, so that she has become skilful in the use of it.

Everything was ready for the operation before commencing with the administration of the anæsthetic.

The patient, placid and sleepy from morphia, was arranged on the table so that her left thigh and leg were abducted over the edge

of it, the left foot and leg being held by a nurse. Protective sterile and antiseptic towels were arranged all round, so that nothing but the thigh was left uncovered, loopholes being left for the application of the tourniquet at the upper part of the thigh. All instruments were in readiness.

The patient's mouth was cleansed. The Ormsby ether inhaler was swabbed out with carbolic lotion, and ½ oz. of ether was poured upon the sponge.

The patient was told to hold her arm up as long as she could, and to take deep breaths. Skill and experience tell at this stage. The anæsthetist must think with the patient and prevent any feeling of suffocation by a sympathetic application of the inhaler, as any dread of asphyxiation is sure to cause fear and struggling, both of which are fatal to success. Encouragement in breathing, both inspiration by long breaths and expiration by forcible blowing out, is part of the scheme, as apnœa alone can produce unconsciousness, and combined with ether does so quickly. If the arm shows signs of falling, reminders to keep it up are essential. No one but the anæsthetist should speak, and until the operation is concluded no noise should be allowed.

When the arm of the patient finally fell, the operation was commenced by the application of the tourniquet, and after three more inhalations of ether the inhaler was taken away.

The Tourniquet.—Lister's students were carefully taught how to apply this instrument. The limb was to be raised to a right angle with the body for two reasons: (1) To empty it of venous blood, and (2) To minimise the entrance into it of arterial blood by stimulating the vaso-constrictors. Then the Petit tourniquet was applied. The only excuse for giving up this excellent method was surgical fashion, for which unfortunately only the same reasons can be advanced as are offered for the majority of fashions in other relations of life.

The bloodless tourniquet and bandage of Esmarch became a surgical rage, and when a youth I bought an early one. Objections to it were soon in evidence. The bandage was likely to force septic or malignant or tuberculous particles into the circulation, and the tourniquet paralysed the vaso-constrictors so that on its removal the limb below became hyperæmic, more blood was lost, and much time spent in arresting the flow from dilated vessels. In addition to this a prolonged operation not infrequently caused paralysis of the limb from pressure on the nerves.

To minimise these defects I gave up the chained indiarubber band and introduced the method of applying the bandage as a tourniquet.

When I came to Newcastle in January, 1888, the elastic Esmarch tourniquet was still used in the Infirmary to the exclusion of every

other means, but my reasons for discarding it prevailed, the bandage was substituted, and since then no other method has been in general use.

For ordinary purposes this is satisfactory enough, but compared with the old and unfashionable Petit tourniquet it is a poor mechanism, because with the Petit instrument unscrewing allows of seeing a bleeding point before more than a drop or two of blood has been lost, and tightening the screw can prevent any profuse hæmorrhage at once. With the indiarubber bandage many points are apt to bleed only when it has been entirely removed, and before all are secured enough blood may have been lost to influence the result of the operation.

In this patient's case a rubber bandage was firmly applied round the upper part of the thigh as a tourniquet.

The operation was done on January 8, 1916, by the following steps :—

1. With a long amputation knife a circular incision was made above the knee, through the skin and subcutaneous fat.

2. A lateral incision was made on each side through the skin and subcutaneous fat, about 1½ inches long.

3. The skin and fat were separated from the underlying parts for about half an inch all round the line of incision.

4. An oblique cut was made superficially into the muscles, which were caught in Volsellum forceps anteriorly and posteriorly, and retracted.

5. A circular incision was made at the base of the flaps through the muscles to the bone. The muscles and flaps were retracted by a gauze retractor.

6. The bone was sawn through. The medulla was scooped out for about an inch with a sharp spoon.

7. The femoral artery, which was thrombosed, was ligatured with catgut.

8. The muscles were sutured together back to front, in three tiers, with a figure of 8 continuous suture of thick catgut. The nerves were not touched, because when the extensor and flexor muscles were sutured together they retracted and were deeply buried.

9. The subcutaneous tissue of the flaps was united by a continuous mattress suture of catgut, and the skin by interrupted sutures of the same.

The dressings next to the wound were of sterile gauze wrung out of methylated spirit, and outside of this an abundance of corrosive sublimate cotton-wool, bandaged very firmly on by a bandage fixed to a pelvic band in front and behind.

The tourniquet was then removed, and the patient was put back into a warm bed still asleep. The only sign of returning consciousness

was shown by a slight facial contortion, when one of the skin stitches was being drawn through, but no further expression of sensation occurred. Her condition when the operation was finished showed no change, and she slept quietly for two hours. In all, not more than 1 drachm of blood was lost.

Her progress was uneventful, except that a gangrenous blush appeared on the remaining foot a day after threatening symptoms of feeble circulation had appeared. This, and the bedsore on her back, had healed when she went home on February 8.

After-progress of the Amputation.—The stump was constantly surrounded by hot bottles. The dressing was removed for the first time on the 12th day, because it had accidentally become moistened with urine. There was a blood-stained dry line over the end of the stump, which was healed. Another dressing was reapplied for a week, and was then removed.

The stump was then manipulated by squeezing it and rocking it over the end of the bone, and pressing firmly upon it. This was repeated daily by the nurse, and often by the patient herself. The result was that an artificial limb could be fitted and worn on her return home, as the stump could then bear sufficient weight without discomfort to her.

The points to which I wish to draw special attention may be further emphasized by particular mention. They are :—

1. The method of administering the anæsthetic so that a minimum is required.

2. The absence of hæmorrhage, secured by—

   (*a*) Ligature of the main trunk.

   (*b*) Careful obliteration of all dead spaces by suture.

   (*c*) Firm elastic pressure over suitable dressings.

   (*d*) Leaving the tourniquet in place till all dressings had been securely applied.

3. The method of wound treatment, by which healing can be secured under a single dressing, without drainage tubes or sutures which require removal.

4. The absence of shock.

The exciting cause of shock is still disputed, but several predisposing causes are well known, and the chief are hæmorrhage, sepsis, serious trauma, prolonged anæsthesia, and exposure to cold.

If these can be avoided serious shock is one of the rarest surgical casualties ; and as shock, hæmorrhage, and sepsis are, and always will be, *the* causes of death after surgical injuries and operations, too much stress cannot be attached to their prevention.

No surgeon could be found to reject these principles, but the war has produced differences in opinion as to their practice. The question

of sepsis in war wounds is now one of the greatest national importance.

My object in relating at such length a simple thigh amputation is to show how, by attention to every detail, a result which appeared twenty-five years ago to be unattainable, can now be secured by anyone who will take the trouble to master the principles of wound treatment, and to faithfully carry out the required detail.

Though the result in this case may be thought of as the best possible when gangrene has developed, it falls far short of a real surgical triumph. This could have been attained only by immediate removal of the clot from the femoral artery, followed by suture of the vessel; and as this has now been accomplished in similar cases, it is the duty of physicians and practitioners, who see these cases first, to remember that gangrene may be prevented and limbs saved by early removal of clot from obstructed vessels.

It is easy for those of us who have lived through the surgical revolution brought about by Lister's work, to recognize now that the opposition to and disregard of his views was due either to ignorance of his principles, or inability to carry out the practice of his details, and it has been interesting to watch the progress of the struggle for truth. Lister proved for all time that serious sepsis can be prevented by the use of various local applications. Watson Cheyne has now proved that sepsis already developed can be arrested by similar measures, and details of his methods have appeared in the latest number of the *British Journal of Surgery*.* Without claiming that better methods may not be discovered, he has shown that, given sufficient care in detail, asepsis of war wounds can be secured *now*, and it is the manifest duty of military surgeons to take pains to acquaint themselves with his work. Until bacteriologists discover some method of immunising patients against bacteria and their toxins, they must be content to take a second place in the treatment of wounds. There are surely only two solutions of this problem of wound infection. The first is to kill bacteria in the wounds, a problem which has been solved, though requiring a technique not without dangers and difficulties of its own; and the second to confer such immunity that the most serious wounds may heal without sepsis.

As the second method has not yet been discovered, the importance of the first is paramount—now.

* January, 1916.

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